

FREE!

Winter training guide

THREE NEW 12-WEEK PLANS

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- ✓ **FASTER** Rev your engine
- ✓ **FURTHER** Make it count

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OUTSIDE**
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Fitness

DECEMBER-FEBRUARY 2014/15

**EAT FAT
CYCLE
FURTHER**

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the facts!

**BOOZE &
BIKE RIDING**
CAN THEY REALLY MIX?

**TURBO SESSIONS
TO BEAT THE
WINTER BLUES**

**AVOID INJURY
TRAIN SMART**

**PHONE APPS TO
MAKE YOU FASTER**

**NEW WAYS
TO TRAIN**

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Welcome

Riding in a winter wonderland...

I've always found the start of winter an exciting time; you can write off the previous cycling season with everything you did, or didn't achieve, and make plans for a more committed, more successful year to come. Buying new winter kit, setting goals and creating a training plan gives me a sense of optimism and renewed enthusiasm.

I love winter training so much that one year I upset my brother by going out for a four-hour ride on Christmas morning which delayed the moment when he could start ripping open his presents. Those days are gone now; with experience I will — hopefully — take a more balanced approach!

Balance is for me one of the key words of successful training, although Dave Brailsford would disagree. Brailsford's word is 'compliance'

as Dan Henchy discusses on page 54 in his feature on how to get the most from your training plan. Compliance will get you the best results; if you can stick to your diet, your training plan, your re-hab exercises and recovery, you will improve, no doubt about it.

You won't get fit without a degree of compliance and dedication, but there is room for a little manoeuvrability; on page 40 we look at the very important cake to miles ratio — how far do you have to pedal to justify your favourite cafe stop treats? Similarly booze; most people will enjoy a little tipples around Christmas but other than the obvious hangover what effect will it have on our riding? Find out on page 82.

Get out and enjoy your winter riding!

Hannah

Hannah Reynolds is *Cycling Weekly's* fitness editor. A keen cyclist, Hannah has raced road and mountain bike and has taken part in numerous cyclo-sportives, including the Etape du Tour and the UCI Golden Bike series. She studied sport science at University College, Chichester, before starting work at *CW*, and continues to keep a hands-on approach to the sport by working as a soigneur and massage therapist in her spare time.



Our knowledge of training techniques, sport science and nutrition is constantly evolving. To stay up to date with all the latest developments that you can apply to your own cycling, check out *Cycling Weekly's* extensive Fitness section in each weekly magazine, or visit our website: www.cyclingweekly.co.uk.



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CYCLING Fitness

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**FITNESS
FACTS**



Combat that cold

Colds are a fact of life during winter. Cyclists can be prone to them, which seems cruel as a cold can be a double whammy; making you feel miserable as well as keeping you off the bike says *Simon Schofield*

Several studies have shown that we get more colds when we exercise strenuously because it can depress the immune system. Throw in some life stress on top of the exertion and it gets even worse — the symptoms can be longer and more ferocious.

So what can be done to minimise the risk?

A widely held view has it that regular doses of vitamin C can help. But the truth is that it's a myth. A Nobel Prize winning scientist called Linus Pauling first put the idea forward in the 1970s. He studied extreme athletes and dosed them up with vitamin C. Results showed a small amount of evidence that it could help protect the body against colds, but crucially, only in the case of extreme physical activity.

However, that didn't stop the vitamin industry latching on to the research, and before you could say

atishoo! the idea that everybody could benefit if only they took enough vitamin C spread like, well, a virus.

The theory was thoroughly debunked by the Cochrane Institute, a highly respected body that reviewed the mass of research in the area and pronounced its findings: vitamin C does not prevent colds.

An effective preventative method, or even a cure, for the common cold remains one of the most elusive prizes in science.

Yet one study has offered hope that the risk of coming down with a cold can be lowered. Could colostrum hold the key? Bovine colostrum, a concentrated form of cows' milk full of bioactive components, is often used by athletes because of its supposed all round health benefits.

Researchers at Aberystwyth University carried out a trial where

53 volunteers, all of whom exercised moderately to vigorously for more than three hours a week, were given 20g of Neovite colostrum every day, or a placebo.

The study, partly financed by the European Social Fund, took place in prime cold season, between September and December, and the participants were asked to monitor their health in some detail on a daily basis.

The researchers found that those taking colostrum suffered fewer colds, although there was no effect on severity or duration if they did go down with a cold.

The exact mechanism that may be at play is not fully understood, but the researchers think that controlling bacteria levels in the mouth may be involved.

It's a promising study but more research is needed.

Carb conundrum

Right gel formulation a case of trial and error

In the Autumn issue of *Cycling Fitness*, the article 'Stomaching Success' on page 78 tackled the complicated issue of different carbohydrate sources in energy products, and how your body responds to them. The article looked at the risk of energy gels with a single source of carbohydrate, being more likely to cause stomach problems during long races.

However, carbohydrates are not all absorbed in the same way meaning that some single source gels can be isotonic and easy on the stomach.

We spoke to Emma Barraclough, senior sports nutritionist at Science in Sport (SiS) to clarify. She said: "Simple sugars such as glucose and fructose have a higher osmolality than longer chain molecules such as maltodextrin, which is what Science in Sport products are based on.

"A higher quantity of water is needed with a simple sugar to make it isotonic. This means simple sugars pose a higher risk of stomach upset as they empty much more slowly from the stomach and water is retained with it there. The bacteria in the gut also feed off simple sugars and this can lead to gas and bloating.

"However the maltodextrin in an isotonic formulation means that gastric emptying is maximised, to deliver energy quickly with minimal risk of causing gastric distress, and therefore there is no need to 'only consume one or two in an event', as suggested in the article."

Barraclough explained further: "At Science in Sport we select a very specific

type of maltodextrin with an atomic weight of 52,000 to allow us to create a unique and patented isotonic gel formulation, which has an osmolality of 281 mmol/kg, sitting very clearly in the isotonic range. The article described beverages with an osmolality of under 290 mmol/kg as 'perfect'."

When it comes to choosing the right gel formulation for you, the length of event you are taking part in also needs to be taken into consideration.

According to Barraclough, 2:1 gels containing fructose are best suited to long-distance events.

"Fructose is a low glycaemic index carbohydrate, meaning that the energy from it is slowly available. Whereas glucose is readily absorbed and can be used directly, fructose has to be digested, absorbed, and then processed by the liver before it is in a format the muscles can use to produce energy," said Barraclough.

"This process typically takes at least 90 minutes, and glucose receptors must be fully saturated for this to occur. It is therefore not very suitable for high intensity exercise when you need the energy quickly as high rates of energy production are needed."

Always experiment with energy products in training or at a minor event before you decide which to use on your key event. As much as possible try to use products in the same conditions as you will on race day, so you learn how your body will react to them.



SiS Rego Protein Bar £1.59

SiS's new protein bar breaks the mould; as well as being a great recovery product, it's darn tasty to boot

The guys at SiS seem to be busy. In fact, there doesn't seem to be a month that goes by without another new product making its way onto the production line.

It can be hard to get excited about yet another new energy gel or recovery bar, but we have to admit, this particular bar has created a bit of a buzz in the CF office.

While the nutritional content of the recovery bar is the same as SiS's other products — one 55g bar contains 20g of protein, 20g of carbohydrates and 1.1g of fibre — it's the taste that we're more interested in.

It can be a gamble whenever an existing bar tries to reinvent itself with new flavours, but SiS seems to have struck gold with its mint chocolate flavour.

It tastes great, so much so, that it wouldn't look out of place in the sweet aisle of the supermarket. Some of the people in the CF office are even snacking on them with their cups of teas. Not mentioning any names...

But we have to remind ourselves that this is a sports product and it's designed to help initiate the recovery process — a vital component to improve and enhance performance. But it's nice to see a company which values the cyclist's tastebuds as well.

Contact: www.scienceinsport.com



Chestnuts:





FOOD FOR THOUGHT

Nuts are a very Christmassy food, however, the high level of calories in them mean eating too many isn't always good. Chestnuts though contain a lot less calories than other nuts, so are a perfect Christmas nibble.

Giving a high level of slow-release carbohydrates, alongside vitamins, minerals and fibre, chestnuts are a perfect all-round food. Try using them in stuffing over Christmas time to reduce the fat content.

Endorphins released during exercise trigger positive feelings in the body, and can help reduce stress levels and depression

**FITNESS
FACTS**

BECAUSE IT'S WORTH IT!

Pricy products worth every penny

Ventoux Training Camp Bag £95

Heading off on a training camp necessitates a lot of kit. This voluminous bag from Ventoux has been designed specifically for the travelling cyclist, so has a few neat features you wouldn't get with a bulk-standard suitcase. One pocket has been designed as a cool-bag for keeping your drinks and food chilled, with a mesh holder for your water bottles, while the other end is a waterproof compartment perfect for your sweaty, dirty kit. The main compartment is a whopping 52 litres in size, more than enough space for several changes of kit, shoes and helmet. Below it is another 35-litre space, good for keeping your civvies separate from your riding gear. Thankfully, with all that space, the bag comes with wheels!



www.ventoux-wear.com

Mule Bar's savoury twist

Sweet enough?



Known for its quirky flavours and natural ingredients, Mule Bar began after founders couldn't stomach any more of the chemically energy bars on offer. Now it has taken its range one step further and stepped away from the host of sweet bars everyone produces.

Its new Eastern Express savoury bar is a spicy mix of cashews, almonds, pistachios and oatmeal, perfect for those who've had enough of sickly sweet foods. Savoury foods are a common craving when tackling longer rides, and the Eastern Express has the perfect amount of carbohydrates, 22.5 per 56g bar, to fuel you for each hour of exercise.

Alongside the Eastern Express bar is the Salted Caramel Kicks gel, and although it sounds somewhat sickly this is another energy product with a savoury twist. The Himalayan salt crystals used to make this bar counteract the sweetness perfectly and didn't leave us gagging for water. And while these gels are designed to be taken with water, they are perfectly palatable without. The addition of electrolytes in the gel also helps when you're sweating lots, making them ideal for hot rides.

If you're looking for energy products that aren't too overpowering and are away from the norm of the sticky sweet bar and gels on offer, try Mule Bar's new range. Even though you're expecting a savoury taste it's still a pleasant surprise when you bite into these products and meet a slightly salty taste.

Diet myth busted

It has long been a dietary truism that rapid weight loss will be followed by rapid weight gain but a new study begs to disagree

Weight can be a big issue in cycling, with riders looking for the lightest components and kit for their bikes. If you're looking at shedding weight to go faster, losing a few pounds could be a much cheaper option than splashing out on lightweight bike bits.

Often, gradual weight-loss diets are recommended over rapid weight-loss regimes for those looking to shed a few pounds. This is because of the view that rapid dieting more often leads to quicker weight regain after the dieting has finished, making it less effective. However, a recent study has raised a question mark over whether this is actually the case.

Researchers at the University of Melbourne, Australia, randomly divided 200 participants into two groups. One group undertook a rapid weight-loss diet and the other a gradual weight-loss diet, with both groups using Optifast shakes. The rapid weight-loss group replaced all meals with the shakes, while the gradual group only replaced one or two meals a day with them.

After the required period of dieting, those that had reduced their weight by 12.5 per cent or more took part in phase two, where their weight was monitored over three years. Here they were simply told to follow Australia's national dietary guidelines and visit a dietician once every three months for the following three years. It was found that the speed people had lost weight had no bearing on the amount of weight regained in the next three years.

These findings contradict current thinking that rapid weight loss is less effective than slow weight loss. If anything, these results highlight the notion that fad diets do not work, whether through gradually losing weight or doing it quickly.

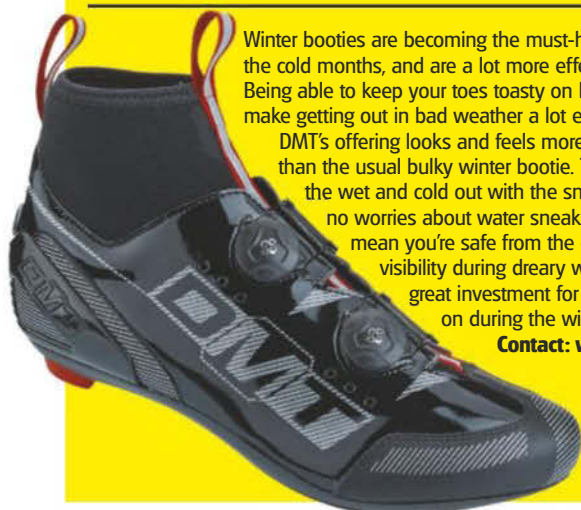
If you're looking to shed weight and keep it off, a change of lifestyle

that lasts is what's needed. This means decreasing calories, or increasing energy expenditure through riding more, to make sure you're burning more than you're consuming. Doing this and maintaining it is much more effective than trying specific diets, and works out a lot cheaper than forking out for a lighter bike!



DMT Nix Road Shoe £145

Give winter the boot



Winter booties are becoming the must-have cycling shoe during the cold months, and are a lot more effective than overshoes. Being able to keep your toes toasty on long winter rides can make getting out in bad weather a lot easier.

DMT's offering looks and feels more like a sleek road shoe than the usual bulky winter bootie. The neoprene sock keeps the wet and cold out with the snug fit meaning there's no worries about water sneaking in. Reflective accents mean you're safe from the cold and give added visibility during dreary winter rides. These are a great investment for riders planning to plough on during the winter months.

Contact: www.paligap.co.uk

40%

of your body weight is made up from muscle tissue and there are around 650 muscles in the body

Those that cycle regularly can expect to have the fitness of someone 10 years younger

FITNESS FACTS

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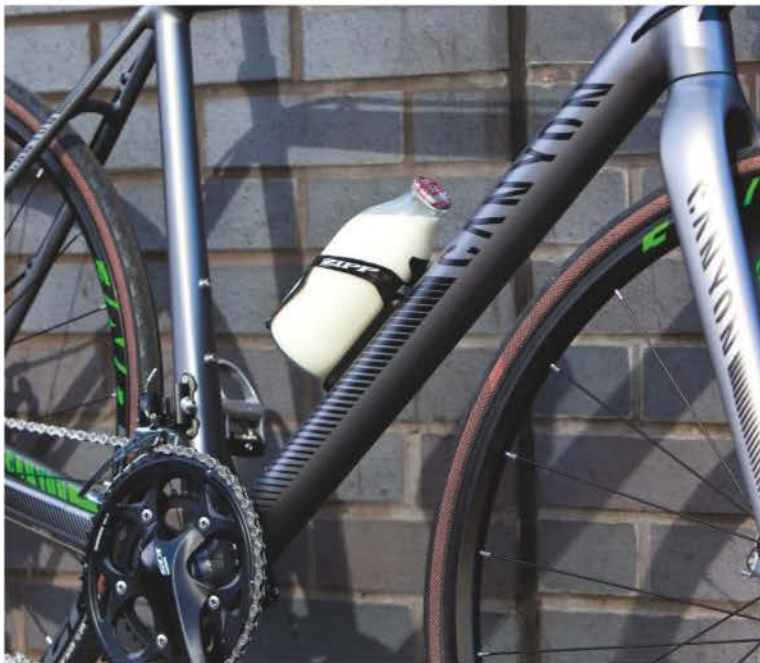
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Black day for milk

The time-honoured nutritional advice to drink milk for healthy bones has just been called into question by the latest research from Sweden

Osteoporosis is a very real problem among cyclists. Due to the low-impact nature of the sport, not enough stress is put through the joints and bones to properly stimulate bone strengthening.

Over recent years a body of research has grown indicating that osteoporosis is prevalent among long-term cyclists. Impact sports such as running, mountain biking and weight lifting are advocated as they create enough stress to promote bone growth. However, another way to support bones and joints is through diet, most notably by eating foods containing calcium and vitamin D.

The NHS recommends consuming milk to help with osteoporosis and advises that 550ml (a pint) provides a healthy amount of calcium for the day.

However, according to a new study conducted by researchers at Uppsala University in Sweden, calcium does very little to strengthen bones and can even double the risk of an early death.

The study, published in the *British Medical Journal*, tracked 61,000 women and 45,000 men for 20 years and found no reduction in broken bones for those who consumed the most milk. Their results also showed that those who drank three glasses or more a day (680ml) were

twice as likely to die than those who consumed less than one.

"Our results may question the validity of recommendations to consume high amounts of milk to prevent fragility fractures," said lead author, Professor Karl Michaelsson.

"A higher consumption of milk in women and men is not accompanied by a lower risk of fracture and instead may be associated with a higher rate of death."

These results conflict with what we've always been told. Calcium is needed for bone building, but it is thought that the fat in milk cancels out the positive effects of calcium, triggering inflammation and increasing the risk of heart attacks.

The researchers found that low-fat dairy products such as cheese and yoghurt had a positive effect, reducing early death and promoting bone health.

However, British researchers have said that the research should be treated with caution, because milk in Sweden is fortified with vitamin A — too much can negatively effect bone health — and that this unaccounted-for variable could have an impact on the findings.

They advise people to consume a balanced diet from the five key food groups of which milk and dairy are vital.

Intensity of riding has a bigger effect on heart health than duration cycled; those that cycle harder can live significantly longer

FITNESS FACTS

Research weighs up road safety

Coloured cycle paths embolden motorists

As cycling increases in popularity so does the knowledge surrounding it and the need for there to be suitable infrastructure. It can be hard sharing the road with cars, hence the 'us and them' mentality that sets in.

Despite the perceived risk being higher to cyclists on the road, the health benefits of cycling outweigh the risk 20:1. When combined with the benefits cycling has on the economy, congestion and the environment, it's no wonder many EU governments are promoting cycling initiatives, including introducing specific cycling lanes, to achieve a sustainable, clean and efficient transport system.

Recent research published in *Transport Journal* has looked at whether cycle lanes actually increase cycling safety.

The study used bicycles equipped with video cameras to record how closely drivers overtook cyclists in three different road environments. Results were used to determine if riding in colour block cycle lanes, plain cycle lanes or on no cycle lane at all affected the distance at which cars passed by, along with the cyclist's stability and safety.

Overall, greater distance was given to cyclists when they were in a cycle lane than not. However, colour block cycle lanes had a slight negative effect on the distance given. This suggests that drivers were more cautious when there was less definition between the cycle lanes and the rest of the road.

The researchers concluded that other factors had a much larger impact on cyclists' safety than the presence or absence of a cycle lane. The width of the entire road, street parking, opposing vehicle flow and speed were more influential than decreased passing widths. Driver behaviour was noted by the researchers to be a very important, yet unquantified factor, and the report recommended further research.



YOUR FREE!

Winter training guide

THREE NEW 12-WEEK PLANS

- ✓ **FITTER** Target weak spots
- ✓ **FASTER** Rev your engine
- ✓ **FURTHER** Make it count

The cover of the 'Winter Training Guide' features a photograph of three cyclists riding on a road. The cyclist in the foreground is wearing a black jersey and a white helmet. The cyclist behind him is wearing a pink jersey and a white helmet. The cyclist further back is wearing a green jersey and a green helmet. The background is a blurred green landscape.

WINTER
TRAINING GUIDE

FITTER
Targeting weak spots

FASTER
Condition your engine

FURTHER
Make this winter count

Your training guide
should be attached here

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RIDING

Getting out the door when the weather is bad is always a challenge but once you are out there it is never as bad as you imagine.

However, cycling in cold weather is actually harder. Cold air is more dense than warm air so it is harder to push through. A good excuse for riding slowly if ever we heard one!

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Give yourself the best chance of improving this winter by following these simple tips



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Getting outside will improve your mental and physical well-being. Don't be a slave to the turbo



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Tips from an osteopath to the cycling stars

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Free apps you can use to improve your riding

9 WAYS TO IMPROVE YOUR WINTER TRAINING

It's often said that 'winter miles make summer smiles' so getting this part of the year right will give you every chance of making 2015 your best season yet.

Dan Henchy of coaching company PBscience offers nine training tweaks to help set you up for a successful 2015.

01 TRAIN IN YOUR RACE POSITION

This is a big win for many riders. The adaptation you get from riding a bike can be very specific to the position you are riding in. For example, if you wish to ride a time trial or triathlon using your aero bars next year, then some time spent riding in that position will be more beneficial than time spent sitting on the bar tops or riding a gym bike in a completely different position. Too often athletes make great gains in fitness over the winter and then find they have to take a step backwards when the race bike comes out in the spring. The time trial example is an obvious one but the same can be said whether you ride a road, mountain or track bike. You don't have to do all your riding in that position but try to include one or two sessions or sections of your ride in your race position each week.





02 MAKE HAND-WASHING A HABIT

I would hazard a guess that the common cold is responsible for more days of missed training than any other cause. Thinking carefully about your personal hygiene routine can be one way to minimise time off the bike and maybe squeeze a few extra days training into the plan that would otherwise be lost to a duvet day or a case of flu. Here are some things to think about:

Wash your hands regularly, particularly before meals. Carry an antibacterial gel for times when a sink is not available;

Clean and sterilise your drinks bottles regularly. All that country lane muck splattered over the tops of your bottles can't be good for you;

Change out of your wet, cold kit and shower straight after finishing a ride;

Take a recovery shake immediately upon finishing your most strenuous sessions. Beyond simply replenishing your energy stores, these drinks have been formulated with the right types of carbohydrate, protein, vitamins and minerals to quickly restore immune function.



03 MAXIMISE ADAPTATION

It's important to remember that the aim of completing training is to achieve an improvement in your performance. The ultimate goal then should not be to simply do more training, but to get more improvement. You might argue that we're splitting hairs here and the two go hand in hand, but what if you could get a bigger improvement without having to do extra training? Unless you've been living under a rock for the past few years I'm sure you've heard or read about depleted training or fasted training or training on low glycogen. If not the idea is simple; rather than following the traditional dogma that your training must always be fuelled by a ready supply of energy in the form of carbohydrate, instead we deliberately restrict carbohydrate intake before and during a training session.

Both research and experience support the view that this will trigger a bigger improvement in your performance in the long run. That final point is important: you might not necessarily experience the benefits straight away (in fact fasted training can be a little miserable!) but over time you will trigger more adaptation. In other words you might perform worse in training but persevere in the knowledge that when you race with proper fuelling you'll perform at a higher level. A good place to start is with 45 minutes of steady riding, first thing in the morning before breakfast. Try this once or twice a week and see how you get on before upping the duration or intensity. As an added bonus, if you have an off-season weight loss goal then this sort of training can be a secret weapon for shedding that unwanted extra bodyweight.

04 MAINTAIN SOME SPEED

Traditionally, the winter training months have been about abandoning intense training and instead focusing on long steady miles to build a solid base of endurance. Some would even go as far as to say that all hard efforts should be removed from your training! However, modern understanding suggests that this is not necessarily the case. In fact there's a risk that if you abandon all high intensity training through the off-season it will take too long to rebuild that area of your performance in the spring.

There's no need to stick to structured interval training throughout the winter, but perhaps include a 20-minute stretch at the end of your ride where you push the pace a little, or rekindle the age-old tradition of sprinting for town signs against your friends. A few high-cadence bursts on the turbo-trainer can also generate some leg speed without necessarily being taxing at a cardiovascular level.





06 BIKE HANDLING

The focus of many of the tips here is on your physical performance but for many cyclists, another area that offers massive room for improvement is in technical skills, better known as 'bike handling'.

This can take on many forms but a quick audit of your skills can identify areas that need work. Can you confidently remove a bottle from your cage and take a drink without veering off line? Can you corner both to the left and the right with confidence? Can you ride no-handed to peel a banana and avoid stopping? How tight a U-turn can you perform without unclipping? Do you panic if your rear wheel slides a little under heavy braking? Are you comfortable riding around other riders? Can you ride in a paceline?

The list of questions is endless but the risk is that come the winter months you spend so much time on the turbo-trainer and in the gym that you emerge into the new season without having addressed the problems from the previous year, maybe even worse off after having lost a little sharpness from so many hours indoors.

There's no easy answer to this but be sure to write some skills practice into your plan. Slow-speed handling can be practised in a quiet car park without having to venture too far from home. Alternatively, many clubs and coaches run skills sessions through the off-season at the numerous closed-road circuits around the country. If you know this is an area that needs work make sure that you do something about it!



05 PUSH YOUR BOUNDARIES

One of the drawbacks to becoming more experienced as a cyclist is that you become all too familiar with your personal limits. Every cyclist will remember those rides as a novice where you bit off more than you could chew — a little more distance than you could handle (or often a lot more), or not taking enough food with you or simply riding too hard at the start before grim reality took hold later in the ride. That interminable last hour where you can only stare six inches in front of your wheel and every minor incline sees you frantically downshifting is an experience familiar to all cyclists. It's often the one we look back on most fondly.

In my opinion, apart from the memories, these rides are also partly responsible for the steep learning curve we experience as a new cyclist. There's a risk as we learn more about the sport that we take less risks, so if you're looking for something extra this winter why not schedule a challenge ride for once a month. This can mean adding extra duration — if you normally ride for three hours on a Sunday then once a month go out for five. Alternatively, if you normally ride with the intermediate level club run then try the fast run once a month.



07 TRY ANOTHER DISCIPLINE

The winter months offer a chance to expand your horizons and explore some of the other cycling disciplines. Whatever your preferred event, after a long summer one of the goals of the off-season is to recharge your mental batteries as well as your physical ones. They say a change is as good as a rest, so if the thought of another cold, wet ride on the road bike doesn't exactly thrill you then why not take the mountain bike (MTB) out on your local trails? You'll still probably get cold and wet but the slower speed on a MTB reduces the wind chill and makes it feel a whole lot more comfortable. If you have identified bike handling as a target for improvement then riding off-road is a proven way of sharpening your skills.

Alternatively, maybe you ride MTB through the summer and riding the road offers a respite from the hard, variable effort of riding off-road and probably reduces the amount of time you need to spend cleaning and maintaining your kit. Or if neither option floats your boat then seek out your local track for some fixed-gear action. This is another great way to hone your handling and get some speed in your legs to boot. Many of the professional road racers turn to the track in the winter on the six-day circuit or dig out their cyclo-cross bikes for some off-season variety.



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08 IMPROVE YOUR GENERAL CONDITIONING

Cycling is a wonderful way to improve your general health and fitness but it can be a little one-dimensional. Spending countless hours bent in half at the waist can lead to tightness in the hip flexors, slumped shoulders and weak glutes. Moreover, cycling is a non-impact sport so while that makes it a very safe and practical sport for those with dodgy knees for example, it can lead to problems with bone density later in life.

A great suggestion is to use the off-season to work on core strength and flexibility. It might not have a direct impact on improving your cycling fitness but better posture, reduced risk of injury and improvements in muscle imbalance and tightness can all make you feel like more of an athlete. Indeed it's rare to find a cyclist who hasn't suffered from back pain or other discomfort on longer rides so this sort of conditioning should be considered essential.



09 RIDE WITH OTHERS

We've already briefly touched on the idea of seeking out some faster riders for stretching yourself physically but the benefits of riding with others extend far beyond simply getting a good workout. Finding a good group to ride with gives the option of learning from more experienced cyclists. Observe when they eat and drink, the lines they take through corners, when they change gear, when they ride out of the saddle — your learning curve can be greatly steepened by taking cues from someone who knows what they're doing.

On the other hand, once you've been riding for a season or two don't underestimate how much knowledge you have that you can pass on to less experienced riders. Set aside a day a month to ride with a friend who is new to cycling and you'll be amazed at the difference you can make to their cycling. Cycling is a tough sport and there is often no tougher time than in the cold, dark winter months. Having some company during this time of year can make the hours pass much more quickly.

If you want to make the most of your off-season then it takes a little more thought than simply accumulating as much time in the saddle as possible. This is a time for working on weaknesses as well as preparing for the following season so take one or two of these tips that resonate with your own cycling and try to incorporate it into your own plan. Off-season training doesn't have to be complicated but a few 'tweaks' can make the difference between a good and a great 2015.

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HOW TO STAY INJURY-FREE

Rebecca Charlton interviews osteopath and ex-pro cyclist Alice Monger-Godfrey, who tells us why we should listen to our niggles before they stop us riding

After frequenting the cobbled Classics as a professional rider for Great Britain, Alice Monger-Godfrey knows how demanding cycling can be for your body. Throw in the fact that most of us have a taxing day job it's no wonder we often end up with a few niggles.

Monger-Godfrey is now a qualified osteopath and has been working with elite athletes like Lizzie Armitstead, helping to keep the Commonwealth champion and Olympic silver medallist at the top of her game.

Given that Monger-Godfrey knows a thing or two about keeping our bodies in tune, we picked her brains on how we can help ourselves instead of visiting the osteo couch every week to fix our aches and pains.

CF: What are the most common reasons for seeing an osteopath?

AMG: Often it's the case that someone has had pain for quite a long time, typically lower back pain, which is what we are renowned for seeing as osteopaths. But I also see a lot of neck, arm and wrist pain, then there's the shoulders and all of the back, knee, ankle and hip — so it is literally absolutely everything!

Being based in cycling, obviously I see a lot of cyclists and we look at how their muscles are firing, how everything works, on and off the bike. A lot of people come for preventative measures and people think 'I'm getting a bit older, I need to look after myself'.

People have personal goals, so it could be anything from wanting to ride 100 miles next year, or they just want to be able to take their kids to the park. It's often a preventative measure to stop them becoming injured or being in pain.

CF: What has the biggest impact on our body: time on or off the bike?

AMG: It's a bit of both. At the top level, elite racing cyclists and people who train full-time only ride their bikes. If they're not riding their bike they're not standing, they're not even sitting, they're lying down and resting, so a lot of their time will be spent on the bike, especially if they've taken it up at a young age.

But when you're looking at people who are doing it at a recreational, but high, level, it's often a combination of both. What you do get is someone who's taken it up



in their 30s or 40s and hasn't ridden before. They have maybe played sport when they were younger but they've been at quite a desk-bound, sedentary job for up to 15-20 years and they then decide, 'I'm going to go and do a race' and they haven't prepared for it. The risk then is that you overload your body and get injured. And that's where the problem starts for a lot of people; you're going from not doing very much to complete overload.

CF: How can we avoid body overload?

AMG: It's always important to set goals, make sure they're realistic and know what you want to achieve. A reward system is important, too. Celebrate each goal you reach with a big sense of achievement.

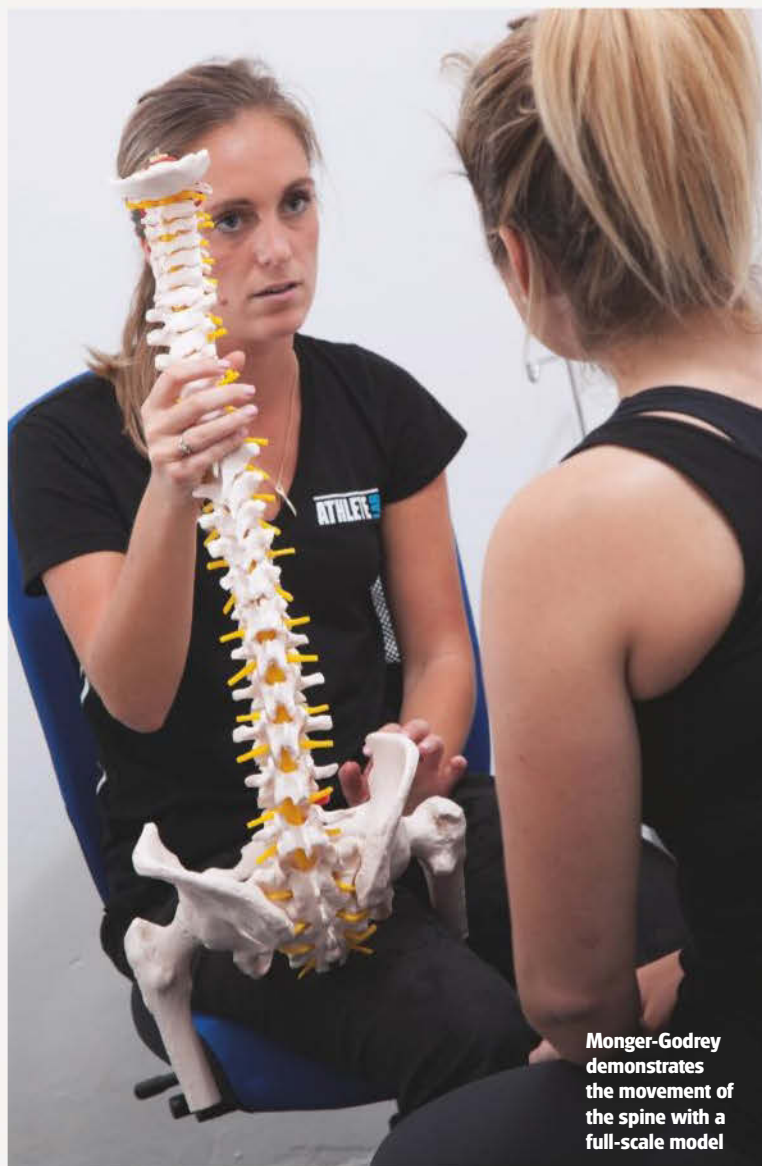
Cyclists often present with lower back pain and one thing I advise a lot is that Swiss gym balls are amazing, if you can get hold of one and use it to sit on if you're at a desk. I know this can be really difficult if you're in an office and you see someone bouncing around, but if you sit on a fit ball it will help to hydrate all your discs.

CF: Hydrate our discs?

AMG: In the spine we've got spongy bits in-between the vertebra, and they act as shock absorbers; my analogy is that I see them as a Rolo; hard on the outside, squidgy in the middle. Sometimes due to age, trauma or lifestyle effects the hard outer surface can begin to crack and the softer surface comes through. This is when you get disc problems and lower back pain. A fit ball allows you move around, which helps increase blood flow and hydrate those discs.



Keep your shoulders back to achieve correct posture



Monger-Godfrey demonstrates the movement of the spine with a full-scale model

ADVICE FROM ALICE MONGER-GODFREY



As a junior rider Monger-Godfrey was identified as a rising young talent on the Olympic Talent Team for Great Britain, and was chosen for Dave Rayner funding. She gained a number of international results and national titles, representing her country and racing for multiple high-profile teams.

Since retiring from professional cycling, Monger-Godfrey graduated from the British School of Osteopathy as an MSt osteopath, sports masseur and medical acupuncturist. She's also a National Standard cycle training instructor and is registered with the General Osteopathic Council, Institute of Osteopathy and the Osteopathic Sports Care Association. Contact: amgosteo.co.uk and athlete-lab.co.uk

Water is your best friend. Keep drinking and you will hydrate the discs, and also your sleeping position can help. If you can get on your left side in bed it will help your blood return — the venous return — that's fantastic.

Obviously people toss and turn during the night but we always recommend, and again it's down to the individual, you should try to neutralise your neck position in terms of pillow height, and by lying on your side you'll be in a more neutral spine position.

When you lie on your front, you completely change the way your spinal curves are and sometimes it can cause problems but it's all part of a package really.

CF: How do we know if we need an osteopath?

AMG: I treat patients who have multiple sclerosis and diabetes, or minor issues and a number of things and, I'll be honest, if someone's had back pain for 20 years I'm not going to solve it in one treatment, but you can set some realistic goals to work towards. It's all about reviewing and changing goals to tailor to your individual case.

CF: How can we stay out of the injury clinic?

AMG: A lot of it will be looking in a mirror. Keeping aware that your shoulders need to be back, but it's natural that they start to fall forward because a lot of us are at desks or slumped on the phone all day. In the morning, ➤

look in the mirror at your posture and it's about bringing everything back and up.

When you're sitting at the desk it's about making sure your wrists and forearms are resting on a surface, not just hanging off. Keep things on the desk, an armrest or something to keep everything supported. If you can, make sure that your eye-line at your monitor is straight ahead, not tilted up or down or to the side. You can tell when people are constantly turning to the right to answer the phone because it patterns through their whole body. It's about keeping everything in line so you're not twisted. Try and keep both feet on the floor and not have them crossed, so you keep everything as neutral as you can. Use a pillow to keep a natural curve.

If you wear glasses it's really important to go to the opticians because if your prescription is wrong you'll be rotating your head in order to see.

Every opportunity you have, get up and walk around, even if it's just to get a glass of water. If you could stand up every 15 minutes it will really help. Your multifidus muscle actually stops working after 20 minutes if you stop moving, so it means everything is less well supported. If you can get up and walk around it means it's initiated again when you sit down. It will make a big difference just to stand up.

Simple things like your bag and the way you carry it can make a difference. Many people carry a bag on one shoulder but it's better to use a rucksack as it will even the weight out.

I know they're not as cool but you can get quite nice ones. Be aware of how you are as well. If you're sad, stressed or upset during the day everything changes, so if you can try to really relax, take deep breaths and be aware of your body position that can make a big difference as well.

CF: Why does an osteopath often ask general health questions in a session?

AMG: We take a full medical case history at the start, and often with lower back pain we ask about bladder and bowel movements because sometimes that can have a big effect on the back, and vice versa.

For someone who has problems going to the toilet but doesn't think it's necessary to mention it, it's important for us to know, because they could need to tell their GP or there could even be something underlying that they haven't told anyone about.

It's important we ask those personal questions that are relevant to what they're presenting with, but they're maybe thinking 'why would my osteopath be asking me about going to the toilet?'

With women I always ask about their menstrual cycle, because sometimes it can be they haven't noticed that the lower back pain coincides with their time of the month. It's putting two and two together, so it can be a really important part of the picture. It's still your body and it all functions as one. That's why it's important to ask those often embarrassing questions.

If people tell me they're getting pins and needles in their feet, are tired all the time and they have sweet breath, they go to the toilet more but they're not drinking more, that can be an indication of diabetes. It's my job to notice these things.

CF: What's your advice if we don't have anything major that's worrying us but we want to stay in good shape?

**EVERYONE GETS THEIR
CAR MOT'D BUT NOT
MANY PEOPLE GET THEIR
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Discs in the spine need to be kept hydrated

Persistent aches and pains are a warning sign you should heed



"As a professional athlete I am fully aware of how much strain I place on my body, and having an osteopath I can trust and who not only understands the body but the sport of cycling inside out, makes Alice extremely rare and invaluable."

Lizzie Armitstead

AMG: I think it's really important to get your bike set up correctly and just enjoy your riding. It's not until you become ill or injured that you might realise how good it felt to be fit and healthy, and have your body functioning properly; people take it for granted. Everyone gets their car MOT'd but not many people get their body MOT'd, and it's the best machine you're using every single day.

It's good to be body aware. There will always be something you can improve to function as best you can, and be as comfortable on the bike as possible. You may want to go a bit faster, or your neck may ache after a long ride, or you may feel tired, but you can achieve your goals.

You don't have to be in raging pain to come and see me, or to correct your bad habits day-to-day, it's all down to you. Stress has a big effect on the body, so try to address that.

Keep it up too — it's easy to think you are fixed, but it is all about maintaining the good habits. My goal is to get people, within reason, seeing me as little as possible. It can start as 100 per cent me and zero the rider, and then the percentage shifts as we go on, so it moves towards being 90 per cent down to you.

The other thing is you need to stay active where possible. People often have that initial niggles and stop completely. They think 'I'm not going to do anything', and sometimes that can make things worse because nothing's being used then, and you can strain other parts of the body. So you must keep active but keep within your limit.

Also you should act before it's too late. A lot of people start to cope by taking painkillers but it's important not to ignore things and you will recover quicker.

READY TO RIDE

Stay injury-free

KICK START YOUR **FAT** **BURNING** THIS WINTER

Dr Graeme Stewart PhD

The festive season is upon us, and with it comes a tantalising selection of decadent foody treats. Not exactly conducive to keeping fit and firm during the cold winter months, is it? However, take heed in the following words and you'll find yourself pedalling into next spring toned and ready to roll...

Give people unlimited access to food and they gain weight. It is no secret, and every winter we torture ourselves over the festive period, trying in vain to resist so many tempting treats. It is hardly surprising we gain weight, given that our brains and bodies have been hardwired by thousands of years of evolution. Hunger is one of the most potent motivational states we possess, although it is almost obsolete in our nutritionally opulent lives.

With unrestricted access to energy-dense, effortless, ready-made foods, perhaps anti-hunger would be a more beneficial emotion to help us maintain a healthy weight? Once the food has passed our lips our thrifty bodies allow nothing go to waste with any excess calories being stored for leaner times or in case of famine. The closest most cyclists I know ever get to a famine is running out of food before the end of a long ride, or being

forced to share a pizza with their other half.

Weight itself is not the main issue for most people. Now more than ever men and women don't want to be too thin, and strong is the new skinny. Cyclists want to shed the excess baggage but don't want to lose power and strength. So, losing weight is not the ultimate goal, it's losing fat. Fat is the body's repository for all the excess calories we consume. The killer blow is that it's not just the fat we eat that gets stored; the carbohydrate we eat is also readily converted to fat and stored too.

So we want to be fitter, stronger but also leaner. You just need to look at elite weight lifters or shot putters to realise this is not an entirely natural combination. At the other end of the spectrum, elite tour cyclists are famous for their translucent skin and light frames that make it hard to believe they put out the power they do. For the typical competitive or health-conscious cyclist the goal is to lose fat

and maintain muscle mass and strength.

The holy grail of the UK's £120 million weight control industry is a product that will help you burn more fat with less effort. Countless products are available claiming to do this, most with dubious or non-existent evidence regarding their effectiveness or indeed safety. A classic example of this was the use of arsenic — Agatha Christie's poison of choice — as a weight loss aid during the 19th century. While there is no doubt that arsenic works, getting the dose right so it did not kill you must have been tricky.

So does that magic bullet exist? That effective, safe, effortless way to lose fat and stay strong? Almost certainly not. As any experienced and moral cyclist will tell you, there is little substitute for hard work and discipline. There are some tricks, though, that might help, so let's take a look at some safer options to kick start your fat burning this winter.

1

**HIIT IT HARD:
HIGH INTENSITY
INTERVAL TRAINING**

High intensity interval training, or HIIT, has been one of the most controversial topics in weight loss over the last few years. It is well established that exercise at any intensity not only burns energy but stimulates fat metabolism. Even after exercise we continue to burn energy — a phenomenon known as 'excess post-exercise oxygen consumption' or EPOC. For years, scientists have been trying to answer the question, does HIIT increase EPOC and fat metabolism more than regular training?

The scientific literature is unclear to say the least, but it now appears that in the 24 hours following a HIIT session you are unlikely to burn any more energy or fat than after a comparable steady-state workout.

Longer-term studies looking a regular HIIT training programmes are much more encouraging, however, with numerous reports of significantly improved body composition and increased fat utilisation compared to steady-state training.

Another factor to consider is that longer workouts also tend to stimulate appetite much more than HIIT sessions, resulting in compensatory overeating, so if you enjoy a post-long-ride binge don't be surprised if you fail to shed the pounds.

So if you have dropped the interval training for the winter or just never tried it, then maybe it is time to get going. Sessions incorporating as little as three to six minutes of hard work can offer similar aerobic and metabolic gains to steady workouts as much as 10 times as long. This works because HIIT provides a potent stimulus to muscles maximally activating key biochemical pathways very quickly.

There is a huge range of HIIT sessions to choose from, but one of the most simple and effective involves 30-second maximal intervals. Start with as little as eight 30-second efforts, with at least 90 seconds recovery, which can be spent turning the legs very easily. Progress this by adding intervals and increasing the power output but not by reducing rest or increasing duration — sustaining the high intensity is key. Try this for four to eight weeks over winter and I guarantee you will feel improvements in fitness and body composition. ➤



2

EAT FAT TO BURN FAT: A LOW-FAT DIET DOESN'T EQUAL A LOW-FAT BODY

Eating more fat is one of the quickest and easiest ways to burn more fat — guaranteed. If you find that confusing you are not alone. More than 50 years of marketing and health advice in the media have persuaded you that the way to lose weight and be healthy is to eat a very low-fat diet. Ironically, it turns out that much of the research that this was based on was wrong. The problem with low-fat diets is they need to be high in something else and that is carbohydrate.

We now know our bodies are adept at responding to stimuli, whether that is your cycle training or the food you eat. Over time, ingesting a low-fat, high-carbohydrate diet reduces our ability to metabolise fat, increases the bad forms of cholesterol in the blood and can disrupt insulin and glucose regulation. Eating fat stimulates the expression of genes required for fat metabolism. This increases our fat-burning potential even in the short term and also improves the ratio of good to bad cholesterol. Even just a single high-fat meal before a



workout will increase your fat burning during that session.

The downside of eating higher fat options is controlling calories. If you are looking to incorporate more fat in your diet be careful to reduce calories elsewhere — as you can guess, simply putting butter on your pancakes

is not the answer to fat loss!

For example, swap porridge for scrambled eggs and cheese before your long ride and you will not only burn more fat during that ride but over time you will boost your endurance and become a better fat burner.

3

TAKE THE PLUNGE: COLD WATER EMERSION

I doubt you have ever heard of 'non-shivering thermogenesis', but you will have heard about cyclists using ice baths or cold water immersion to aid recovery. There is a hidden benefit to cold water immersion that was not known about until relatively recently.

Non-shivering thermogenesis is a process where our body squanders energy in return for heat. A particular sub-compartment of fat tissue, known as 'brown fat', is specially adapted for this and happily burns away to keep us warm. Needless to say, if we could harness this system it would be a boon for fat burning and weight loss.

Well, in 2012, researchers identified a hormone produced by muscles called Irisin. Irisin appeared to act on fat cells to stimulate brown fat characteristics, thereby increasing energy expenditure and fat burning.

What stimulates Irisin release? You guessed it, cold exposure! Regular cold water immersion will increase the release of irisin and promote the fat 'browning' that can boost your overall energy expenditure and fat burning significantly.

This is another low-effort trick but does require a considerable degree of willpower in order to have regular cold baths. The good news is that you only need to submerge your legs and the water does not need to be any colder than 14°C and some studies find 16°C effective.



4

SLEEP IT OFF: PROPER REST IS ESSENTIAL IN WEIGHT LOSS

How can sleeping well possibly help you lose fat given that even lying down awake requires more energy than being asleep? This basic level of energy use is known as the basal metabolic rate and is known to drop when we fall asleep. Sleep deprivation is also well known to increase daily energy expenditure by around five per cent, again not a great argument for sleeping off the flab.

Sleep deprivation, however, has profound effects on key hormones including cortisol, leptin and ghrelin that regulate energy expenditure and appetite. Levels of the satiety hormone leptin are severely affected by lack of sleep. Leptin is part of the body's natural mechanism to regulate fat storage and acts directly on the brain to control appetite. Numerous studies have shown that the increased eating stimulated more than compensates for the extra energy used due to sleep deprivation, leading to significant weight gain. Furthermore, leptin also acts on the thyroid gland and sympathetic nervous system to increase metabolic rate and fat metabolism.

The net result is that if you want to eat less and be leaner a good night's sleep is essential. If you need any more reason to get an early night, after we fall asleep the ratio of fat to carbohydrate burned increases. So while energy use is very low during sleep we are burning mostly fat.



5

SUPPLEMENTARY INFORMATION: THE GOOD, THE BAD AND THE UGLY

If I were to write something about all the supplements claiming to improve fat burning it would fill a phone book. Here I have simply chosen a few of the most popular and well-researched examples, some good and some bad.

Conjugated Linoleic Acid (CLA) is a naturally occurring fatty acid present in large amounts in full-fat, grass-fed, dairy products. There is significant interest in CLA having multiple potential health benefits, but the one of most interest to us is its ability to reduce body fat. Early animal studies showed significant and consistent results in favour of CLA reducing body fat, but disappointingly only a small percentage of the human studies have managed to show the same. Differences between animal and human trials are frequent, not least because laboratory animals do not have the same diverse diet we enjoy and are normally wholly deficient in CLA. The conclusion is that while CLA may be effective, it is likely that you are able to get ample in your diet, such that taking extra will have no additional benefit. If you are lactose intolerant or avoid dairy through choice, however, then a CLA supplement


might be useful. Note that the eating 'grass-fed' dairy is key, so look for organic products to guarantee they will contain the CLA you're looking for.

Ephedrine is an amphetamine stimulant and a regulated substance that, while not illegal, is prohibited in sports above a certain concentration. It is a big favourite among body builders and many formulations are available that also contain caffeine and great tea extracts. These potent concoctions certainly boost metabolism but can also raise heart rate and blood pressure, as well as cause palpitations and arrhythmias. Long-term use can lead to heart attack and stroke, even in healthy people, so it is very risky for anyone and should be left well alone!

L-carnitine is another popular supplement with athletes looking to boost their fat burning. A naturally occurring co-factor, L-carnitine is synthesised in the body and helps transport fatty acids in cells, boosting fat metabolism. Few supplements have better theory to back them up. However, in practice, L-carnitine supplementation seems ineffective as it fails to get into cells. The few studies that have been able to establish an effect required co-administration of insulin, or large sugar doses to spike natural insulin levels for long periods of time. While this supplement might help, it is unlikely to yield any significant weight loss, except from your wallet.

Spirulina is a slightly less well known supplement but one that has merits beyond fat loss. This nutrient-dense cyanobacteria is rich in minerals and certain fatty acids. Like most supplements there are many wild claims about its health-giving properties, but some initial research has suggested it may boost endurance and improve fat metabolism during exercise. This natural product is thought to be safe and nutritious and, who knows, it may be the next big fat-burning craze.



A photograph of three cyclists riding on a paved path. The cyclist in the foreground is wearing a red jacket and a black helmet. The cyclist in the middle is wearing a red jacket and a white helmet. The cyclist in the background is wearing a white and black jacket and a white helmet. The path is surrounded by green trees and foliage.

Is it really harder
cycling in the cold?
Yes, it is. Cycling on
cold days feels harder
and on the rare occasions
we reach summer speeds,
the effort to get there
feels disproportionate
to the energy expended.
But why? Simon Schofield
investigates

COLD HARD FACTS



In many ways cold weather doesn't really matter. Most, if not all, cyclists will accept that once the shorts and thin summer jerseys are packed away until the clocks go forward, progress will be stately rather than spritely.

Long, slower rides outdoors in winter have a serious training benefit, helping to build a strong aerobic base for the coming season.

But given that forward motion in exchange for effort expended is the essential joyful equation of all cycling, many of us ponder exactly what is going on to impede progress when the temperature goes down to single figures.

Let's examine the possible causes and see which falls into the "convenient excuse" category and which is "that's proper science, that is".

1 A WINTER BIKE IS HEAVIER. SURELY THAT'S A GOOD REASON FOR GOING SLOWER?

Part of this is true. Winter bikes are nearly always heavier. Many riders will have a winter machine and it might be steel rather than carbon. It will be encumbered — although some say protected — by mudguards, and it may be laden with lights. The training effect of this is all good. The old saying 'train heavy, race light' means that when you get back on the summer bike it will feel like a featherweight.

Jeremy Groves, a consultant in anaesthesia, timed himself over his 27-mile commute between Chesterfield and Sheffield and published the results in the *British Medical Journal*. He did around half the time (about 800 miles) on a heavy steel bike that weighed 13.5kg and about half on a carbon framed number that weighed 9.5kg. In other words, a pretty good approximation of a winter versus summer bike.

He did 30 journeys on the steel bike and 27 on the carbon. Total journey time was a fraction over an hour and three quarters. Jeremy did the fastest single ride on the steel bike, but overall the lighter bike was quicker. But not by much. In fact, averaged out, it was just 32 seconds per journey quicker on a bike that was 4kg lighter.

We feel faster on a light bike and we go a little faster on a light bike, perhaps because we're trying harder. But a light bike is not a lot faster for the same effort than a heavier bike.

Verdict Weight matters, but not as much as you'd think.

Try this Stay positive about your winter bike. Keep it well maintained and fix niggles, like rubbing mudguards, as quickly as you can. The extra lights, mudguards and heavier tyres will make your riding safer, more enjoyable and protect your bike from mucky winter roads, so the extra weight is worth it. ➔



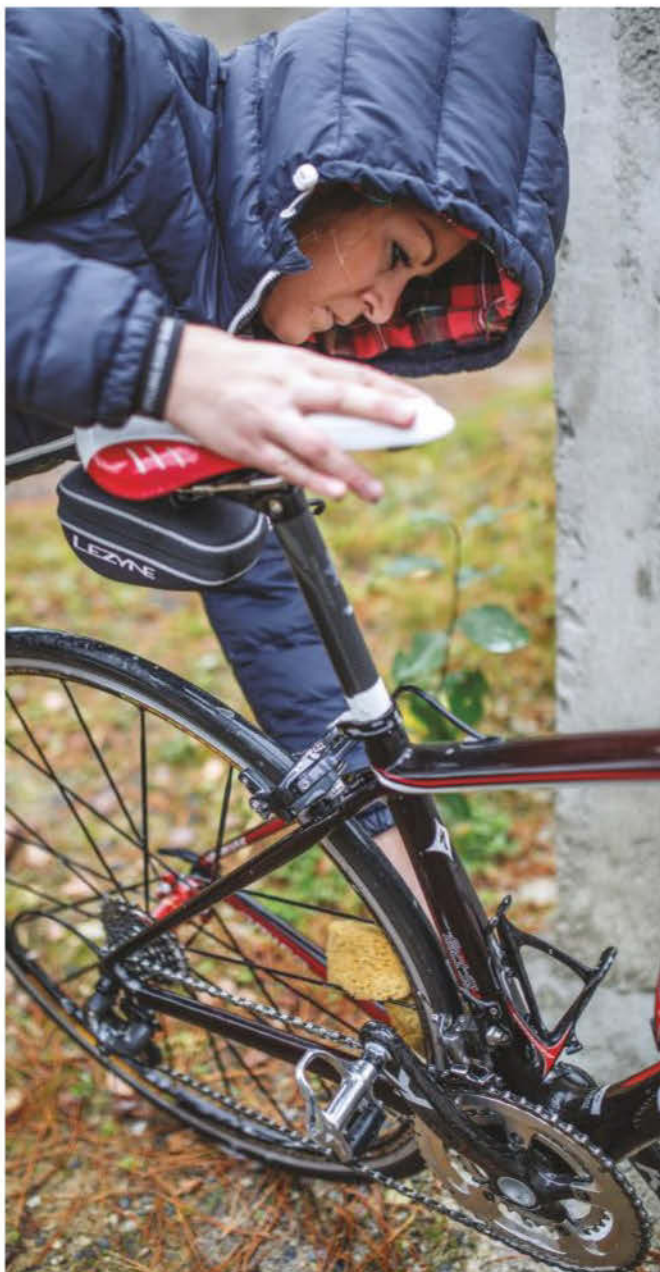
2 IT'S MY BIKE'S FAULT — IT DEFINITELY GETS SLOWER WHEN IT'S COLD

Cycling is about rotation. Many of the factors that contribute to speed go round and round and that is made possible by bearings. The really important ones are in the wheels and the bottom bracket, although the more obsessed time triallists will change their jockey wheels in search of less friction and more speed. Nearly all bearings rely on grease to help them spin freely, and they don't like being contaminated by water or dirt. Aside from that, most grease will thicken slightly in the cold. Winterising your bike will mean that bearings will have been checked for contamination, but not even the best mechanic can stop the grease thickening.

Well, it could make a miniscule difference. The friction freaks claim that fitting super-expensive ceramic bearings can save a few watts. But many proper scientists are sceptical of those claims. Slightly thickened grease is not going to make a detectable difference as long as the rest of the bearings are in good order.

Verdict Good thinking but this is just an excuse.

Try this A really good service of the winter bike and regular checking of tyre pressures, while keeping the bike as clean as you can, will keep you rolling smoothly in the darker months.



3 WHEN I PUSH HARD THE BOIL-IN-THE-BAG FACTOR REALLY GETS TO ME

Base layer, jersey, jacket, gloves, hat, neck-warmer. And that's just the top half. Long tights, extra thick socks, maybe even winter shoes, but definitely overshoes. Getting ready for a ride when it's chilly takes forever.

And, just as you're ready to go, you need to go to the loo. Doh!

The layers trap heat nicely — but as you soon as you start to push on, the temperature inside all that clothing rises very rapidly and you are very uncomfortable. This slows you down.

This effect, while undeniably present, is a psychological not a physical barrier. The understandable wish to avoid discomfort caused by overheating can prevent you from going hard. But there's nothing physiological going on here — it's simply a natural reaction for us not to want to get too hot. It can be overcome. In summer for instance we will give it full beans getting up a climb with the sun beating down. We get just as hot, but the unrestricted feeling of fewer clothes makes it seem easier than when it's cold.

Verdict Nice try — but you can still go hell for leather up a climb in summer when it's hot.

Try this As a rule of thumb you should set out on a ride feeling ever so slightly underdressed. If you're a fraction cool for the first 10 minutes, you've probably got it about right. Use lots of layers in winter and look for breathable outer layers with zips for ventilation.

WINTER WOES

There are a couple of other things to watch out for when cycling in the cold. These two afflictions can affect your enjoyment of winter riding.

RAYNAUD'S PHENOMENON

Sometimes called Raynaud's disease, or more commonly 'white finger', this can affect cyclists disproportionately — because we are more likely to get out in the fresh air when it's cold.

The small blood vessels of the fingers contract, look white and feel cool. In severe cases, the fingers can change from white to

purple and then bright red. Other extremities can be affected, but it's most common in the fingers.

Raynaud's is a bit of a medical mystery. While the process of constriction is well understood, the causes are unknown in 90 per cent of cases. In the other 10 per cent of cases, there is a separate underlying reason.

It's uncomfortable and especially so in cyclists, where changing gears or operating the brakes can become a real challenge, but it's not dangerous, unless, of course, that makes you crash.

About one in 20 people will develop Raynaud's and it's more common in women than men. Treatment is all common-sense stuff and largely amounts to

4 THE AIR FEELS LIKE SYRUP WHEN IT'S COLD. THIS MAKES ME SLOWER

We are all familiar with this one. Cold, and possibly damp, air makes it feel like you're pedalling through treacle. Moving the air that's in front of you — or tunnelling through it — seems a much stiffer proposition than on a warm summer's day. Result: slower progress for the same effort.

Yep, this one is bang on the money. It's why velodromes are kept at around 27°C. Cold air is denser than warm air and it really does take more effort to get through it. And as shifting the air that's sitting in front of you and your bike is the biggest single resistance to higher speed, it makes perfect sense that if it's denser it's harder and therefore slower. But by how much?

At 25°C, and a speed of 15.5mph, you need to push 8.26kg of air out of the way every second, assuming your frontal area is about one square metre. Drop the temperature down to zero and the amount of air you need to shift goes up to 9kg each second — that's an increase of about 10 per cent to achieve the same speed. In other words for the same effort, your speed would drop from 15.5mph to 14mph. That is significant.

Verdict Valid excuse. There is proper science here.

Try this It's much easier said than done, but staying aero in winter is even more important than summer. Minimise flappy clothing and ride in the drops.



keeping not only hands and feet warm, but the whole body. So good choices in winter clothing are essential if you suffer from Raynaud's.

There is a drug treatment, but if Raynaud's warrants that it is best to discuss the options, and possible side effects, with your GP.

EXERCISE INDUCED ASTHMA

Even people who don't usually suffer from asthma can get a bout caused by exercise. And the risk is higher if you are breathing cool air. So cycling vigorously in the cold can be a double risk factor.

Exercise induced asthma has the same effect as 'ordinary' asthma. The airways narrow

making breathing difficult, causing wheezing.

It's another mystery. The reason why some people get exercise induced asthma and others don't is impossible to say. According to Asthma UK, it is thought that having colder, drier air in the airways triggers symptoms of asthma.

A warm-up before cycling in the cold can help prevent attacks, as can wearing a thin covering over your nose and mouth so that air is slightly warmed up before it's breathed in.

And the same drugs that can mitigate true asthma are just as effective for those with exercise induced asthma. Talk to your GP for more information.



5 SURELY WINTER CLOTHING IS LESS AERO?

Aerodynamics, or the drag factor, are critically important areas for riders trying to keep speed high. It's why pros spend hours in wind tunnels and contort themselves into uncomfortable looking positions in time trials. It's why teams spend thousands on special fabrics that cut through the air like a knife. It makes sense that heavy winter clothing is less aero — doesn't it?

It's not so much the heaviness of the clothing as the increased frontal area that bulky clothing creates. If your shape is larger, you have to work harder. A set of clothing that is only, say, 5mm or 10mm thicker can make quite a substantial difference when that thickness is multiplied by your whole body. It's less of an issue down below where tights tend to be close fitting, but in the trunk it can make you more Michelin Man than Skinsuit Man. That slows you down.

Verdict Yes, you've hit the real science bullseye again.

Try this Keep the clothing as tight fitting as you can. Modern fabrics provide plenty of stretch as well as other desirable wind and waterproofing properties; this means you can wear them tight without feeling restricted.

A person wearing a green cycling jacket, black shorts, and a helmet is riding a road bike on a paved path. The path curves through a lush, green landscape with rolling hills, olive trees, and dense foliage in the background. The scene is bright and sunny, suggesting a clear day.

THE GREAT OUTDOORS

If you hibernate indoors and stick to the turbo for training sessions this winter you'll be missing out on the huge psychological and physical benefits of being in green spaces. *Gordon Cairns* tells us why we shouldn't neglect the great outdoors

On my cycle to work through the south side of Glasgow I add a good few minutes each day to my commute by travelling through two parks; no matter how much my fingers tingle with the cold or how grey the skies are. With those extra five minutes I could have time to make a coffee to drink at my work desk, yet I forgo this morning's caffeine hit to cycle through something green, bringing me psychological and physiological benefits which could be far more positive even than caffeine.

Exercise psychologist Mike Rogerson, who specialises in green exercise as part of the Green Exercise Research Team at the University of Essex, says that even a short diversion off the road and through a park will have a positive effect on my mental wellbeing when I get to work: "Your commute into work through a park, based on the research we have done so far, means you are more likely to have a positive psychological state when you arrive at the workplace than if you were to ride along the road, so you turn up to work in a better mood."

Recent research suggests that I should extend my autumn and winter cycling beyond my daily city commute and head into the countryside, instead of retreating to the drudgery of the turbo trainer as I normally do at this time of year. This will reduce my levels of stress, tension, anger and depression, while boosting my self-esteem, mood and cognitive functioning.

The effects can be immediate and long-lasting. Within the first five minutes of outdoor exercise, studies have shown that blood pressure can reduce and will remain low into the evening after a morning's green bike ride. Furthermore, short-term exposure to green exercise can improve mood and self-esteem regardless of the duration, intensity, age, gender or health status of the participant. This could be of particular interest to those suffering from seasonal affective disorder, since low mood and lack of self-esteem coupled with lethargy are all symptoms of this debilitating winter condition.

How much a cyclist will gain from their winter ride in the country will depend on how deeply they engage with nature. A ride through a pine forest on a mountain bike track will bring greater green benefits than riding on a tarmaced road through moorland, for example.

Rogerson explains two ways that biking through woodland works to reduce stress and bring psychological benefits to the rider: "If you cycle along a forest track, the chances are you are going to have to be more mindful of the interaction between your bike wheel and the ground below, with lots of bending and turning making you more aware of the terrain rather than simply cycling down the road," he says.

"The general rule is the more you are immersed in something, the more likely it is the positive effect will happen. This type of cycle would be absolutely ideal if you felt you needed to be engaged in nature, which brings psychological benefits."

However, it is not just the concentration needed to tackle the technical aspect of the ride which will connect you with nature, but also the sensory factor triggered by the essential wood oils secreted by the trees as you

ride past. And importantly for those living in the UK considering a winter ride, our evergreen pine trees as well as oak are especially potent.

"The chemical phytoncides released in the plants and trees might be more beneficial as you cycle further into the forest," Rogerson says, "as you will be exposing yourself more deeply to those chemicals than simply by being in the countryside."

Phytoncides are airborne chemicals released by plants to protect them from rotting and insects, which studies have found may also benefit immune function in humans.

Rogerson adds that if you can find a forest trail ride which incorporates a section by a river, lake or sea, then your health could be receive an additional boost. "As a related strand to being exposed to these chemicals, research shows that where there is a higher concentration of negative ions — which are charged particles — in the air, these could bring health benefits."

"These ions are more prevalent in natural environments and are created by things like movement in water, so if you are in the countryside near the sea, there is a higher concentration of negative ions which can bring physical health benefits as well."

This concept of reducing stress through embracing nature is known as 'Shinrin Yoku' in Japan, which translates as 'forest air bathing', a far more poetic term than 'clinical ecotherapy' as it is sometimes known in the UK. In the Far East, groups have been going out walking into the woods for over 30 years specifically to reduce stress, and often through a prescription from

their physician.

Research conducted by Dr Qing Lee of the Nippon Medical School, Tokyo — who is also secretary general of the International Society of Nature and Forest Medicine — used essential oils released from trees to fortify the immune system, and suggested that forests can do more than reduce the symptoms of anxiety, depression, anger and stress.

Speaking to the BBC recently, Dr Ling said: "I found that essential oils increased the activity of immune cells, and exposure to essential oils can improve immune function."

But many scientists believe the reason why the countryside has such a calming effect on our psyches is not just the sensory impact of essential oils, but goes back to mankind's evolutionary past, when our ancestors first descended from the trees to set foot on the rolling grasslands. As we cycle through a beautiful landscape, subconsciously we may be appreciating that the forest in the distance can provide us with shelter and berries, while the river can bring us fish and something to drink.

Rogerson explains: "We are better attending to stimuli in natural environments than we are within built city environments. As a species, humans evolved on the savannahs of Africa, so when we are exposed to that type of environment we have a positive emotional reaction. One of the reasons being that visually, it provides everything that we need, such as food and water sources, which gives us a positive response, whereas an urban environment doesn't provide those basic human needs."

Evolutionary theory also explains why cycling in the city can sometimes be such an unenjoyable and stressful experience, as mankind struggles to adapt to the lack of open spaces and busy streets of our urban environment. He adds: "If you consider the timelines and where humans have been living since we came down from the

WITHIN THE FIRST FIVE MINUTES OF OUTDOOR EXERCISE IN THE MORNING, STUDIES HAVE SHOWN BLOOD PRESSURE CAN REDUCE AND WILL REMAIN LOW INTO THE EVENING. FURTHERMORE, SHORT-TERM EXPOSURE TO GREEN EXERCISE CAN IMPROVE MOOD AND SELF-ESTEEM

trees, it's only a fraction of that time that we have been living in cities, so as a human it is quite stressful to be dealing with new stimuli. We haven't got the required circuitry hardwired in our brains to come up with an appropriate response to living in the city yet."

Compare this to surveying the clouds moving across the sky, while looking down at the rolling farmland from the top of a hill in the weak wintery sunlight. This can be one of the quiet pleasures of the sport 'off-season', especially as the cold will have denuded any trees of their foliage, thus increasing our perspective compared with the summer. According to attention restoration theory, this effortless attention will also improve our concentration when we return to our urban environment and busy lives.

Rogerson expands: "By being in the countryside you would have a greater perspective and see further into the distance than being in the city, and according to attention restoration theory the greater the extent of the view you have in nature, the easier it is to allow yourself to relax and to soak up the environment."

However, he adds that cycling through a city park may offer an alternative benefit, different from, but just as useful, as this recharging of the concentration batteries: "You would think that being in the countryside would be better, but it doesn't take into account the contrast of being in a busy city centre such as London and then suddenly shifting to the isolated feeling of being in a park.

"Built environments have their own, often negative effects, so you have a double whammy of the negative effects of the built environment as well as the absence of nature. The contrast of the buildings to a short, sharp burst of the natural environment of a park may cause some relief to your brain, away from an environment that is perceived as hostile."

Rogerson notes: "This could be quite powerful and have another beneficial effect, although this hasn't been researched thoroughly yet."

The science of green exercise hasn't fully researched the seasonal effect of exercising outdoors yet either, but Rogerson did examine the effect of wet weather on those exercising in nature. He found that during exercise, climatic variables such as rain had less effect on participants than if they were simply out in bad weather.

Similarly, research has shown that the amount of the colour green seen by someone exercising can have a positive effect. How would dull winter colours affect someone hoping to benefit from green exercise? "Research showed that videos tinged with different colours of green have varying effects, so there is reason to believe that less green would make a difference, although it would still be more beneficial than other less green environments. But we have no way of quantifying how much difference it would make."

However, to gain the most powerful effects from green exercise, it is best to immerse yourself fully in nature and go out into the countryside, so that not only would you be seeing nature, you would be fully engaging with it. Rogerson considers our interaction with nature as a series of levels: "You can have a view of nature by looking outside through a window which is the same as watching a video of nature on a screen, which brings a certain level of engagement.

"The next step up would be actually being present in nature by simply sitting on a park bench, but not interacting with it. The highest and most beneficial level would be doing some physical activity while you are interacting with nature. This is how we can maximise the effects of nature."

EXERCISING OUTDOORS CAN...

lower blood pressure,
reduce feelings of stress,
increase cognitive functioning,
boost immune function,
improve mood and
self-esteem

Above:
Get out and
ride to boost
your health,
cognition
and mood

BRING THE OUTDOORS IN

If you really can't face going out on the roads after the clocks have gone back, it is still possible to achieve the benefits of green cycling without leaving the house or shed. In the past, my eccentric

uncle would set up his road bike on rollers facing an open window during the dark winter nights to feel the wind and damp air on his face as he cycled. And he may have hit on something, as he was likely to have gained some form of cognitive benefit from this set-up, thereby improving his mental processing.





Rogerson says: "You would certainly gain some cognitive benefits by having a view of nature if you set up your exercise bike at an open window or garage door, as the visual environment will have a positive effect."

Additionally, research has shown that simply looking at a film of the countryside while exercising

will improve our performance as we trick our brains into thinking we are in our natural environment. The University of Essex's Green Exercise research team recorded the cognitive function of volunteers running on a treadmill while watching a video simulating a run through a forest trail or through city streets.

Rogerson reports: "We found that cognitive function improved for everyone through doing the running exercise, but those watching the nature film improved their cognitive function even more than watching something else on the video. So putting a natural image on a screen in front of an exercise bike would make a positive difference."

There are commercial options for cyclists to go down this route of green exercise, with many film clips now available to view, from coastal roads in Italy to crossing mountain ranges in the States, which would all bring the benefits of green exercise, such as reducing blood pressure and stress, without feeling the cold and wet for real.

Places to explore TUSCANY

Many training destinations provide plenty of tarmac but not much soul. However, the area around Lucca in Tuscany has both. It's steeped in cycling culture and history, as well as being covered in excellent rides ideal for training. Even the pros have time to stop for a cappuccino between raiding the nearby hills, and the *dolce vita* attracts riders from across Europe who end up calling Lucca home. *John Walsh* went to find out more

As we rolled into Lucca in search of our morning caffeine, a blur of black bounded past heading towards the coast, texting away on his iPhone and not wearing a helmet so you could make out his perfectly bronzed face. Mario Cipollini was off on his morning ride astride his self-named carbon steel road bike, at a rate that suggested he was still in the pro peloton. Cipollini, with 42 stage wins of the Giro d'Italia under his belt hails from a small village outside Lucca.

The rain-soaked 2013 World Championships started from here before heading east through the Tuscan hills to Florence, but on a late October day the sky's a piercing blue. Tinkoff-Saxo have now set up base in Tuscany, with the exception of Alberto Contador.

In all but the deepest winter months, the hills of Tuscany are waiting to be explored. Isolated from southern Tuscany by the Apuane mountains, Lucca is a cycling paradise. While much of the region is characterised by rolling hills, cypress pines and wheat fields, Lucca boasts steep climbs, high peaks, and quiet valleys. Tourists are few outside Lucca but cyclists are abundant, and it's not uncommon to encounter pros who call Lucca home, such as the up-and-coming Spaniard Carlos Verona.

Lucca's narrow streets are home to many bike shops including Chronò Bikes, run under the experienced eye of Paladino Meschi. Meschi is famed for bike-fitting many a Tour de France rider with a cursory yet scrutinising glance at shape and steel — no tape measure or bike-fit required.

If cycling in Italy is booming then its crowning jewel is Lucca's city walls. At a ramp near the Piazza Santa Maria leading to the top of the walls and where soldiers once patrolled, the local cyclists of Lucca do laps of the 5km circular route round the town on the Passeggiata della Mura, lined with plane and chestnut trees. Some riders boast of clocking up a 50km training ride with 10 whirlwind laps of the city, which if you get up early enough is like having your own private training track.

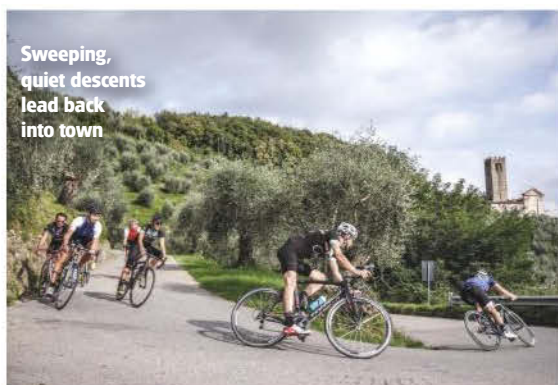
When a budding pro or new young rider arrives in town they are sent up Monte Serra for judgement. At 890m it is quite modest, but steep ramps and an average

APRES VELO

There are numerous great cafe options in Lucca, and there are many places to grab a set menu — but remember that pasta is just the first course! If you can't leave the bike alone, ride the city walls for a nice, leisurely warm-down or take a day exploring the wine route of the many nearby vineyards.



Sweeping, quiet descents lead back into town



There is no shortage of cafe stops to enjoy





"Lucca is a cycling paradise: steep climbs, high peaks and quiet valleys"



Plenty of routes to occupy and challenge you

BIKE SHOP

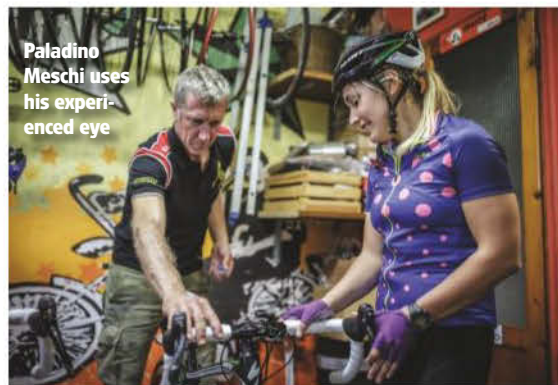
Lucca has plenty of bike shops. The most famous is Chronò Bike run by Paladino Meschi, who rents anything from soft-riding town bikes for within and atop the walls, to new Pinarello FP4s for dancing up the climbs. Under the watchful eye of Coppi and Bartali peering out of the memorabilia-stuffed walls, Meschi uses his super-experienced eye to fit you to your bike and advise you on cycling routes.

RIDE

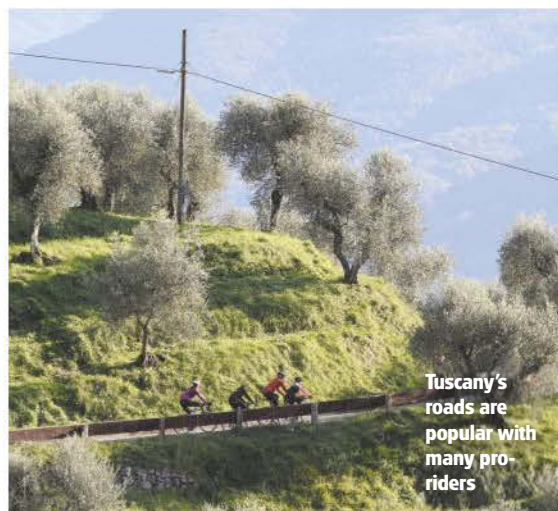
Monte Serra is the prominent tip of the iceberg, dominating the skyline south of Lucca. There are myriad options in the mountains to the north, with lots of quiet, dead-end climbs perfect for training and for measuring your improvement. The climbs go in and out of fashion with the locals; try Cappella for a 5km switchback, with great views of Lucca from the north, or tackle Matria at 969m for a longer challenge. Simply pick a different city gate to depart from each day and you will not be disappointed.

TRAVEL

Lucca is easily accessible. You could base yourself in the town or there are many holiday rentals in the hillside, from where you could pedal into Lucca for your morning coffee. Lucca is just a 40-minute drive from Pisa airport, which has lots of low-cost options to the UK and elsewhere in Europe. It is also on the main Florence to Pisa train line and *autostrada*.



Paladino Meschi uses his experienced eye



Tuscany's roads are popular with many pro-riders

gradient of nine per cent, with sections of 18 per cent, mean all three ascents present a challenge. Monte Serra is a testing ground; many a pro will never return once they have ridden themselves into the ground for their 20-minute max power test, or laid down their time — and many believe in its mythical powers. Pros and local amateurs were timing themselves on Monte Serra decades before the internet, let alone Strava. Local folklore says that some days the mountain wants you, some it doesn't, and riders feel pushed back like a surfer being spat out by the waves.

Despite coming to Lucca frequently, the Giro d'Italia has never ventured up Monte Serra. Many believe the Giro is scared — it could pack as much punch as the Stelvio in terms of chaos and its ability to split a peloton.

Shortly after leaving Lucca, quiet roads are surrounded by a patchwork olive grove-clad hillside, chestnut woodland and the occasional open pasture, as the road begins to climb through Cipollini's village of San Giusto di Compito. Monte Serra is an extraordinarily accessible mountain; a 30-minute flat section on leaving the town makes for a perfect warm-up, before the road climbs following a small river into the wooded hills at the village of Sant'Andrea di Compito.

This is one of Italy's tarmac gymnasiums; at least as many pros test themselves and lay down their times here as on the infamous Col de la Madone, near Nice. From the late 1980s timed uphill efforts have been embraced by coaches, with climbs like Monte Serra being used to measure the all-important metrics of watts per kilogram and VAM — a true measure of climbing speed.

Monte Serra is long enough to do endurance and strength work with its three different ascents providing a variety of gradients. It is certainly not a climb to attack hard near the bottom, as some of the steepest hairpins are near the top and you'll need to hold something back. If you gently tap away you will have no problems with reaching the summit, although it will be unlikely to score you high on the Strava leaderboard, and as graffiti adorning a crumbling building exclaims, "*Sei Dolce Tanto Quanto se Dura*" — it's sweet when it's hard.

CAFE STOP SURVIVAL

Match your treats to your average speed with *Cycling Fitness's* one-stop cafe ride calorie counter, as *Marc Abbott* helps you indulge guilt-free



As autumn turns to winter, riders' thoughts turn slowly away from events and races to find new focus in a season of social rides. Whether you ride with a club, like-minded (and similarly paced) pals or a trusted partner, there's one thing that we all have in common: a love of the cafe ride. But as the hard training takes a back seat for a while, how are we going to enjoy the same sticky treats or hearty grub at the cafe stop without piling on the pounds (or kilos, for the more Euro-minded)? Simple — follow our simple cafe stop calorie-counter.

We've worked out which foods you can wolf down without a hint of remorse, and we've split the treats into three sections, determined by intended average speed, to help you plan ahead. So now you've no excuse for mothballing the bike until spring; get out this weekend, enjoy the ride, and — more importantly — enjoy your food stop. You've earned it...

BULLETPROOF YOUR BODY

No one would deny you a treat if you've put the miles in, but wouldn't it be great if you could feel good about your indulgence, rather than guilty? Seek out these four nourishing foods on the menu to help boost your immune system.

ALMONDS

Containing vitamin E, known for their antioxidant qualities, and packing a healthy amount of protein, these nuts are a positively healthy addition to the top of any cake at the cafe stop. Monounsaturated fat content also helps to lower cholesterol.

SPINACH

A handful of the Popeye's favourite veg will supply you with a hit of antioxidant vitamins A and C, plus vitamin K for bone

health. Potassium content also helps to regulate heart rate and blood pressure.

WALNUTS

Who wants to eat fish on a long ride? No one. But if you're looking for a way to combine indulgence with an omega 3 top-up, get stuck into that walnut and coffee cake — these nuts are high in the essential fatty acid also found in oily fish, which helps with cell regulation. Vitamin E content also assists with heart health.

TURMERIC

Found in the most unlikely of places (mustard, Worcestershire sauce, etc), turmeric's active ingredient curcumin can help lower cholesterol, and, thanks to its vitamins C and E content, also help combat oxidative stress.

TEMPO TREATS

Perhaps you're carrying some red-hot form into autumn and looking for one last reason to rip your mates' legs off. Or maybe you were just late getting ready on Sunday morning and had to play catch-up... Whatever the reasons for your turn of speed, you'll be pleased to read that you won't have to ride above 20mph for very long to burn off enough to justify your favourite snack at the lunch stop. Make it almost an hour at this pace and you're staring down the barrel of a guilt-free full English — what better reason to bring your A-game to the cafe run? ➤



**JACKET
POTATO
WITH BEANS
AND SALAD
(PER 200G)
400 calories**



RIDING SPEED 20MPH

CAFE STOP CALORIE-COUNTER

RIDING TIME IN MINUTES

**FULL
ENGLISH
BREAKFAST**
1,040 calories



**CARROT CAKE
SLICE (1/12TH
OF A CAKE)**
600 calories



**MUSHROOM AND
CHEESE PANINO
(STARBUCKS)**
425 calories



**BELGIAN
CHOCOLATE BROWNIE
(COSTA)**
369 CALORIES



**PAIN AU
CHOCOLAT
(CAFE NERO)**
270 calories



**CUP OF TEA
(SEMI-SKIMMED;
ONE SUGAR)**
42 calories





**CAPPUCCINO
(CAFE NERO)**
37 calories



RIDING SPEED 16-20MPH

CAFE STOP CALORIE-COUNTER

RIDING TIME IN MINUTES

**CHERRY AND
ALMOND CAKE
(LARGE SLICE)**
585 calories



**BLUEBERRY
MUFFIN
(CAFE NERO)**
438 calories



**PLAIN BAGEL
WITH CREAM
CHEESE**
400 calories



**BACON
SANDWICH
(STARBUCKS)**
350 calories



**FLAPJACK
(PER 60G)**
195 calories



**DOUBLE
ESPRESSO
(STARBUCKS)**
10 calories



CLUB RUN COMFORTS

The best weekend club rides operate at a pre-agreed pace, which makes it even easier for you to plan your lunch before you set off with our potted guide. Confident the group's going to stick between 16-20mph for an hour? Then put yourself down for a cream cheese bagel and a flapjack. What's that, you were late and had to skip breakfast? Here's a solution... Pull clear off the front with six miles to go, gun it to the café and treat yourself to a Belgian chocolate brownie from the 'Tempo Treats' menu (previous page). No one will thank you for the attack, but you'll get the last laugh refuelling on chocolate.

RIDING SPEED 14-16MPH

CAFE STOP CALORIE-COUNTER

RIDING TIME IN MINUTES

COFFEE AND WALNUT CAKE SLICE (COSTA)

594 calories



TWO SCRAMBLED EGGS ON TOAST (WITH BUTTER)

450 calories



SPINACH AND ARTICHOKE QUICHE (ONE SLICE; STARBUCKS)

380 calories



PORRIDGE (ONE CONTAINER; CAFE NERO)

234 calories



REGULAR LATTE (COSTA)

129 calories



AMERICANO GRANDE (ONE SUGAR; STARBUCKS)

30 calories



RECOVERY REFUELLING

First things first: are you serious about this being a recovery ride? Being upfront with your riding pals before setting off is the best way to avoid "you said it was your easy day" moans. The good news is, even if you're just chatting away between 14-16mph, you can still treat yourself once you reach your chosen stop — but you'll just have to ride that little bit longer before you can indulge with impunity. Scrambled egg on toast with a sizeable latte is reward enough for sticking below 16mph for an hour.

**CALORIFIC
VALUES SOURCE**
myfitnesspal.com;
based on stats for
a 70kg man

PAIN AU CHOCOLAT (COSTA)

347 calories





5 FREE APPS TO MAKE YOU FASTER

Want to lose weight and get faster? Well you guessed it — 'there's an app for that'. Well, sort of. As *Hannah Reynolds* found out, you still have to pedal the bike and supply the willpower, but there are some fantastic, and cheap tools for helping you become a better bike rider with the aid of your smartphone

FREE BUT FUNCTIONAL

While all of these apps are free, they also offer numerous premium packages and associated products to tempt you to upgrade. Although there are ways to spend more, the free products are highly functional — in our experience we haven't felt any frustration that we were only being given part of the package. So though spending a bit more will get you more bells and whistles, even at their most basic these are useful training aids.

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MYFITNESSPAL

If you are trying to lose weight or clean up your diet then research has shown recording what you eat makes it much more likely that you will stick to your resolutions. MyFitnessPal does far more than just help you count calories. It has a huge range of different foods, including nearly all the major sports nutrition brands, already stored so you can tap in the foods you eat in a day and get a complete nutrition breakdown. You might discover that while your energy intake is in balance, the nutrient profile of your diet can be improved by seeing where any deficiencies lie. Just being aware of what you are eating and looking at the nutrition information of your usual snacks will help you to stay on track with your diet goals.

www.myfitnesspal.com



STRAVA

You can't talk about apps without talking about Strava. Although most people who ride will be aware of its highly competitive nature, it can actually do a lot more than that, and isn't just for the KOMs and QOMs among us.

For a start, Strava makes a fantastic free online training diary where you can record and monitor your progress, as well as gauging how you fair on the leaderboards. Watching your week-by-week totals add up is highly motivating. Regularly testing yourself on the same segment and gaining a 'personal record' will show you whether or not your training is paying off.

Strava is also a good way of exploring new areas, and you'll see where local riders hang out from where the segments are. If you need extra motivation you can join one of the Strava Challenges, which also suck you into the social element of this addictive app.

www.strava.com



MAPMYRIDE

There is a whole host of different sites offering route planning and mapping. However, Mapmyride gets the CF vote for its ease of use and the way that you can fiddle around designing your own routes, exploring them with the yellow 'googleman' and checking their stats, including elevation.

It can be a faff uploading routes from Mapmyride onto other platforms, but by using the app you can turn your smartphone into a navigational device and save a fair few quid on a GPS unit.

As well as designing your own routes you can explore those designed by other users, and share routes with friends.

www.mapmyride.com



CYCLEMETER

Cyclemeter turns your smartphone into an incredibly advanced cycle computer, recording a wealth of data to analyse after your ride. It offers all kinds of added bonuses, such as alerts to help you with pacing and the ability to race against yourself on a previously completed course. If racing yourself isn't enough, it is compatible with Strava so you can upload your data there, too. It can also import and export routes using all file types, so you can use other sites to find or plan routes and still run them through Cyclemeter.

If you love nothing better than a good spreadsheet this generates enough pie charts and graphs to keep even the most dedicated statistician happy.

cyclemeter.com



WAHOO FITNESS

Wahoo Fitness uses ANT+ technology to pair with virtually every fitness device on the market. It transforms your mobile phone into a data hub, so you can view and manage the data you are receiving as you train and choose which metrics to monitor.

The app is the soft way to lure you into the world of Wahoo Fitness, as aside from the apps Wahoo offers a heart-rate monitor and a turbo trainer that will also pair with your iPhone. While the app might not set you back a lot, the turbo-trainer will. At £949 it is one of the most expensive on the market, but its performance and ease of use is truly impressive. By taking out your own back wheel and dropping your bike onto the cassette and hub of the turbo, it eliminates tyre wear. The large flywheel gives incredibly realistic road feel and the resistance can be controlled by your iPad or iPhone.

wahoofitness.com



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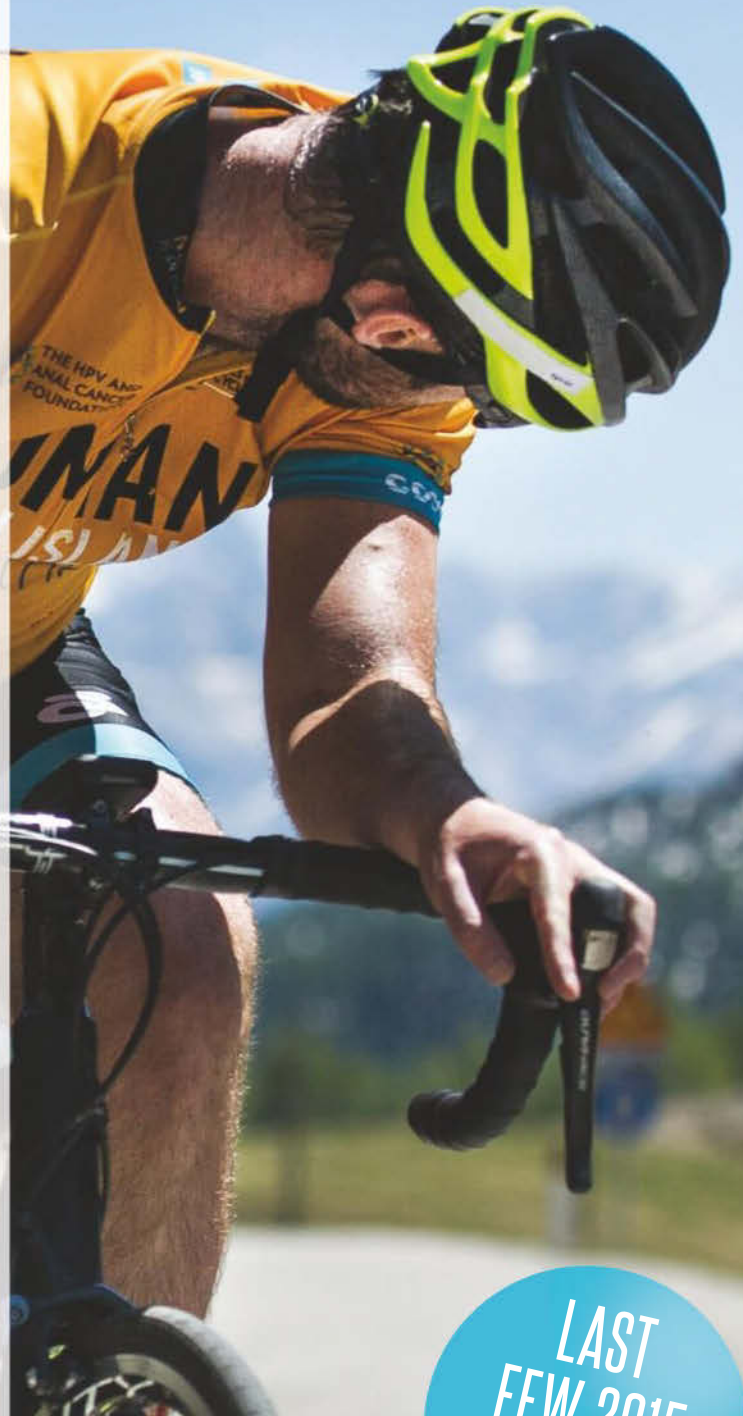
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TRAINING



Indoor training is undergoing a revolution. It used to be so simple: just you, the turbo, and a view of the garage wall.

Now you can race people from around the world in the comfort of your living room or 'virtually' ride Alpe d'Huez.

With so much technology on offer the turbo is becoming a seriously valuable training tool — it really could transform your riding.

If you can't cope with the weather, or training indoors, then it is time for a training camp. Pack your bike bag for sunnier climes — or should that be sunnier climbs?

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Pumping music and disco lights — indoor training gets interesting



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Simple things that will help ensure you get the most benefit from your training plan



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Indoor training meets the virtual world

P64 TRAINING CAMP

Where to go for a warm-weather climbing fix

Taking your training inside

Given the choice, any self-respecting cyclist would choose undulating stretches of tarmac, steep hills and green fields over riding a static bike. But as the winter weather sets in, thoughts turn to indoor training. *Lexie Williamson* explores the different options available

If the words 'indoor cycling' conjure up images of monotonous hours of pedalling while staring at the garage door, you are not alone. But the indoor cycling sector is undergoing something of a revolution.

It is now possible to hire a Wattbike which scrutinises your pedalling efficiency, use an almost silent turbo-trainer that won't chew your back tyres, or compete in a virtual race in one of the new breed of

'performance' indoor cycling studios.

The idea is not to merely keep your cardiovascular fitness ticking over and maintain leg strength until the weather clears, but use this indoor time to tinker with technique and cadence or positively boost power, so you are stronger on the road.

Of course, indoor cycling also provides the chance to train without the irritating interruptions of the road, such as red lights, traffic or junctions. There are also no 'junk miles', as the



Wattbike people dub those idle spells of flying downhill or cruising and chatting with clubmates.

It will never replace outdoor cycling, but the options for indoor cycling are expanding. *Cycling Fitness* has picked three indoor cycling options: Wattbike, indoor cycling classes and turbo-trainers, and compared their cost, convenience and performance-enhancing potential, while three cyclists also argue the case for their indoor training method.

WATTBIKE

Its been called the 'Bugatti Veyron of indoor bikes', developed alongside the brains at British Cycling and

WATTBIKE CASE STUDY: ANDREW WHITTLE

Andrew Whittle turned to Wattbike because he felt his performance had plateaued and the 100-mile Prudential RideLondon-Surrey sportive was looming. Whittle was also keen to "put a number" to his performance, especially in terms of power and maximum heart rate. "I had no idea what my body was able to deliver," he explains.

Whittle had a one-to-one fitness test, and after a few months of training with the data in weekly private or small groups, he found he began to "instinctively" know how his legs should feel when putting in efforts away from the Wattbike screens out on the road.

This was tested when he crashed in the torrential downpours of RideLondon, broke his Garmin and was without any riding information for the following two weeks. "Because of the Wattbike, I knew exactly how hard to push," he says. "I just knew how my legs should feel."

Another main benefit Whittle finds with the Wattbike is to his technique. "I'm a powerful rider, but the instructor pointed out how I could sustain these efforts and ride at an average 20mph for longer and longer periods all through pedalling technique and my position on the bike."

Similarly, Whittle says Wattbike sessions have allowed him to connect with like-minded cyclists, who want to do a faster-paced outdoor ride.



WATTBIKE OPTIONS TO RIDE

Few of us have over £2,000 to spare to buy our own Wattbike, but if you want to incorporate a session into your training routine there are a few cheaper solutions:

BUYING

Wattbike have two main models: the Pro and the Trainer (both £2,250). Which one you choose depends on your power output. The air resistance is higher in a Pro model making it ideal for heavier riders or track sprinters. But be warned, the high resistance makes it hard to factor in recovery sessions. Most cyclists should choose the Trainer, which has low to medium air resistance. It is possible to buy reconditioned or ex-demo Pros or Trainers a little cheaper at around £1,600, but they rarely come up for sale.

HIRING

To try a Wattbike without the large financial outlay you can hire one for a minimum of a month, at a cost of £78 a month.

ONE-TO-ONE COACHED SESSIONS

Wattbike does not have an official teaching accreditation, but offers a one-day coaching course for cycling or triathlon coaches or personal trainers that want to instruct. A coach will set goals, interpret the data and provide motivation. They will conduct an initial 60-minute fitness test to assess 'maximum minute power' or MMP and VO2 max (a measure of the maximum rate at which the body can send oxygen to the muscles). Costs vary but this fitness test is usually around the £60 mark.

GROUP CLASSES

Group classes bring the overall session price down and provide camaraderie and competition. Although cyclists are training together, each will be in their own training zone determined by an initial test. These sessions may have different themes, for example, 80-minute 'race nights', and should cost around £20 per session.

GYM-BASED WATTBIKES

Virgin Active, David Lloyd, Nuffield Health and the local gym company Everyone Active are among those that have stocked up on Wattbikes for members. This might be one or two on the gym floor or a whole room. Wattbike is planning to display instruction boards in front of the bikes to guide members through various workouts.

HOW TO FIND ONE

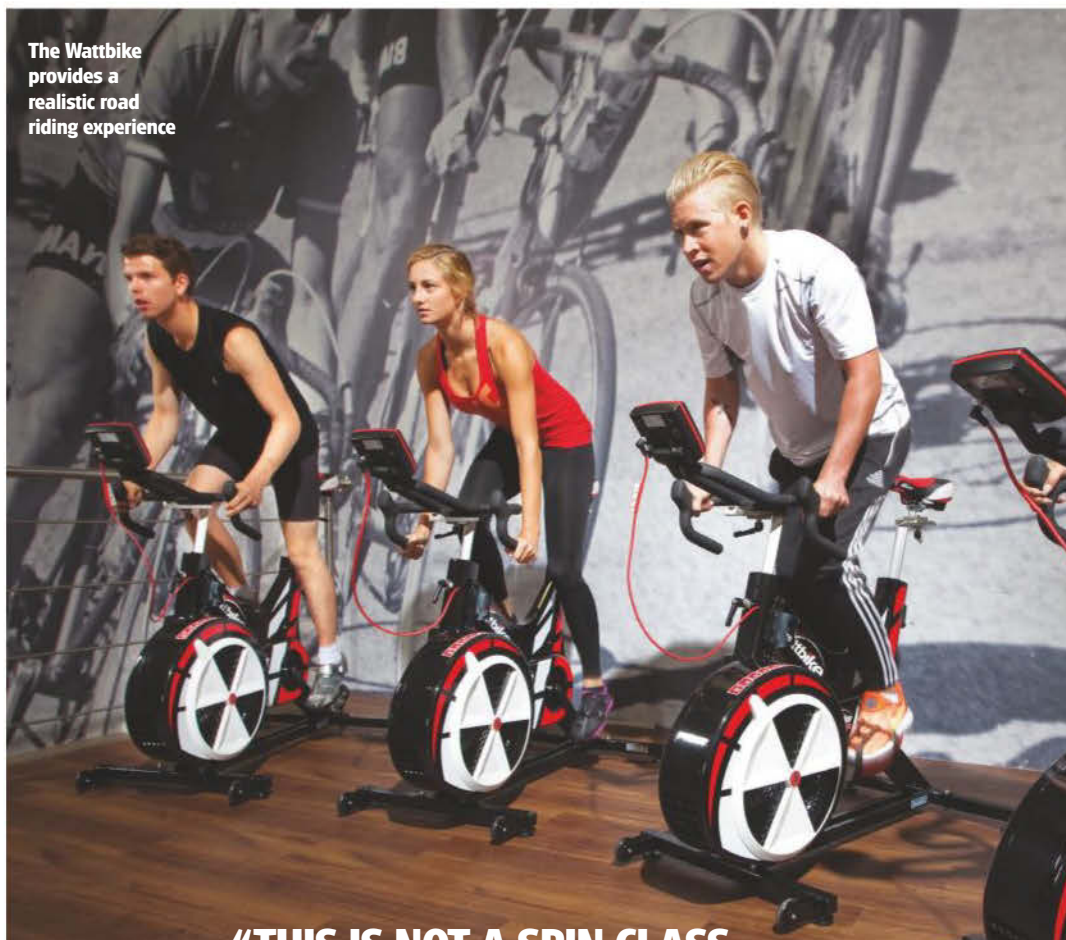
To source a Wattbike across the UK go to www.wattbike.com and click on 'Find a Wattbike'. You can either click on the Wattbike icon on a UK map or scroll down the list of gyms, bike shops and sports shops.

favoured by Team Sky, so it was hard not to be intrigued when two Wattbikes were wheeled into my kitchen. Mark Dressel, director of the Surrey-based cycling performance and fitness specialists RollingDynamics.com, set up the bikes, flipped open his laptop and explained the fundamentals of Wattbike.

Firstly, the bikes are designed to feel like you are riding a real bike with similar resistance and realistic fittings, like road bike handlebars and aero bars for time triallists and triathletes. The session begins, therefore, with a bike fit. This means cyclists can train in positions they are accustomed to adopting outdoors — in line with the central concept that Wattbikes are not meant to supplant outdoor riding, but support it. There's even a magnetic resistance adjustment that simulates the force of gravity for that climbing feel which Dressel, helpfully, keeps turning up.

But the big difference between a Wattbike and turbo-trainer or spinning bike can be summed up in one word: data — enough to delight any numbers junkie. Detailed information of power output is stored so riders can tailor training sessions, monitor progress and test themselves on 'threshold power' or 'maximum aerobic power output'.

The Wattbike provides a realistic road riding experience



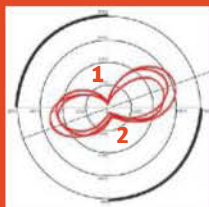
"THIS IS NOT A SPIN CLASS. THERE'S NOWHERE TO HIDE. I CAN SEE YOUR POWER, CADENCE AND PEDALLING EFFICIENCY"

POLAR VIEW FIGURES OF EIGHT TO FAT SAUSAGES

The Wattbike 'Polar View' feature is a graph which shows the force applied to the pedals and their exact position when this was applied. It therefore lets you clearly spot your pedalling weak or 'dead' spots where power is lost.

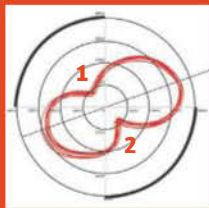
BEGINNER THE FIGURE OF EIGHT

This cyclist is losing too much pedal momentum on the transition from right leg to left leg (1) and left leg to right leg (2). He is only using the quads to stamp on the pedals.



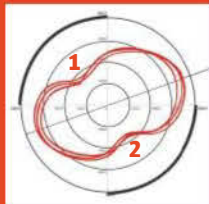
GOOD THE PEANUT

This cyclist maintains some pedal momentum between leg drives, but there is still a noticeable dead spot. Imagining scraping mud off the balls of the shoes to extend the leg drive will improve this.



ELITE THE SAUSAGE

This cyclist has opened his 'peanut' up into a large rounded shape showing consistent balance between each leg and good pedal momentum.



The coolest feature for me, though, was the 'Polar View Force Curve'. This measures pedalling efficiency and leg balance and is a real eye-opener if you thought pedalling was all about hammering down with the quads.

A figure of eight-shaped diagram displays the pedal stroke. The aim is to remove 'dead spots' at the top and bottom by opening out the figure of eight-shaped diagram into first a 'peanut' and then a 'fat sausage' shape. Apparently Sir Chris Hoy's is completely spherical.

After the 20-minute warm-up (the very same one used by Team Sky) Dressel guides us through an interval session and the sweat starts flowing. Its seriously intense and I can't hide at the back.

"This is not a spin class," says Dressel, eyeing our data. "There's nowhere to hide. I can see your power, cadence and pedalling efficiency." This data is also showing on the laptop screen and projected onto a wall with bigger groups, so there's no freewheeling or 'pedalling blind'.

We end with a race. Two little virtual bikes line up and although our legs are shot, the competitive instinct kicks in and we pedal like crazy, heads down, backs flexed and teeth gritted, sprinter style. I can hardly walk afterwards. The floor needs mopping and we've only ridden for 45 minutes.

INDOOR CYCLING

"Indoor cycling has the stigma of being a bit fluffy, like aerobics on a bike," explains Neil Troutman, instructor and founder of the teacher training certification Velocity Indoor Cycling Program. "But I'm a cyclist and see plenty of serious cyclists coming to classes."

There's no doubt that indoor cycling (like the brand Spinning started by pro-cyclist Johnny Goldberg in 1991) has an image problem. But the clientele is changing. I have seen an increase in the number of jersey-clad cyclists and triathletes clipping their shoes into bikes at my gym class. Some attend two or three times a week or sweat through two back-to-back



INDOOR CYCLING CASE STUDY: KIM BAINBRIDGE

Kim Bainbridge, a cyclist of four years, rides around 55 miles a week, but was notching up 150 miles while training for Ironman and the Guildford-based Charlottesville 50 time trial earlier this year.

While races come and go, Bainbridge has religiously incorporated two 45-minute indoor cycling sessions into her weekly schedule, attending group sessions at her local David Lloyd gym. According to Bainbridge, these sessions are a chance to focus on cadence levels — maintaining a consistent 90/95rpm — as well as monitoring her pedal stroke and position on the saddle and aero bars. She also sits on the same bike each class, thus keeping an eye on her average wattage.

"A lot of people who ride at the weekend use indoor cycling classes as a midweek/early morning training session," says Bainbridge. "I don't use a heart-rate monitor but certainly get the opportunity to kill my legs and go breathless several times."

It helps to have a keen cyclist as an instructor who teaches sessions that mimic outdoor riding with intervals, speed work and climbs. Bainbridge had a four-class-a-week habit before buying her first road bike so for her, indoor cycling led to the great outdoors. "It's true to say I became interested in cycling because of spin, and that's the case for many others at David Lloyd."



45-minute classes. So what's the appeal? Like Wattbike, the main appeal of indoor cycling is intensity; the chance to train non-stop without lingering at red lights, roundabouts or negotiating traffic jams. The peaks and troughs of an indoor ride also provide an effective interval training session which can be hard to do outside due to the stop/start nature of the open road and uneven terrain.

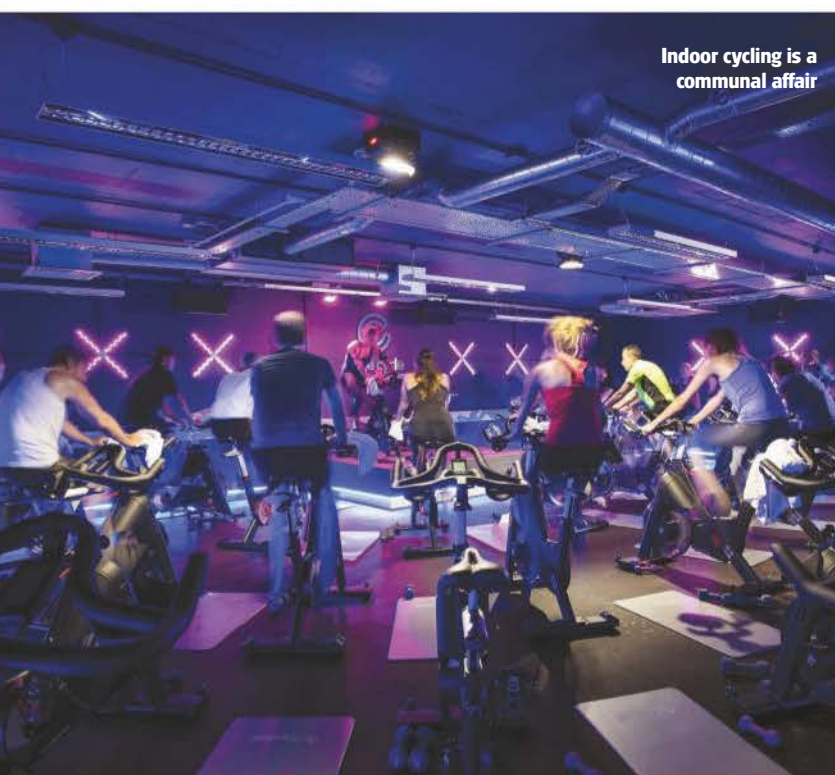
Find an instructor who is also a cyclist, as they understand what you need in terms of training and can also replicate an open road ride indoors; for example, alternating recovery with intense sprint intervals or driving riders up imaginary hills. Expect sweat — buckets of it.

While visualisation works for some, Troutman believes most cyclists prefer to get their heads down and work in their training zones. A quality indoor bike, like Keiser, that records watts, RPM

THE FUTURE INDOOR CYCLING FOR 'REAL' CYCLISTS

Still think indoor cycling classes are for yummy mummies? A new breed of indoor cycling studios is emerging aimed squarely at the serious cyclist. These centres are more likely to have cycling coaches than spin instructors, and enough ride data to satisfy the sports scientist lurking in every keen rider. One such example is Athlete Lab in central London, launched with the backing and cycling savvy of Team Sky's performance adviser Shane Sutton.

Athlete Lab offers 'Adjustabikes' — a static bike designed to mirror a real bike and almost every component can be adjusted to fit. New clients receive a fitness test to gauge their 'functional threshold power' and then focus on maintaining this level of power (watts). Expect to see similar 'performance indoor cycling' centres popping up all over the UK soon, hoping to catch 'real' cyclists on rainy days or in their lunch breaks. Some will come with physiotherapists, masseurs and Pilates classes.



AT THE GYM INDOOR CLASSES THAT MIMIC THE TRACK

Victoria Pendleton has put her name to a series of indoor group cycling classes that aim to give gym-goers a small taste of track events: the team sprint, individual sprint and the keirin. Reflecting a growing appetite for indoor cycling classes that focus on performance rather than

just torching calories, these three 30-minute 'Pro Cycling' classes are being offered to Fitness First gym members.

The team sprint consists of 15-minute high resistance sprints, the individual sprint centres on speed interval training, while the keirin class aims to improve endurance, ending with a four lap race.



and heart rate is crucial. "The more feedback, the more beneficial it will be," he says.

Loud music is also a huge motivational factor when indoor cycling and many studies have shown athletes to push themselves harder when listening to it.

In 2008 the *Journal of Strength and Conditioning Research* published a study by Rebecca Battista et al called 'Physiologic responses during indoor cycling'. Battista examined 20 female students and found that they were able to exceed their VO2 max while watching two videoed, choreographed indoor cycling classes.

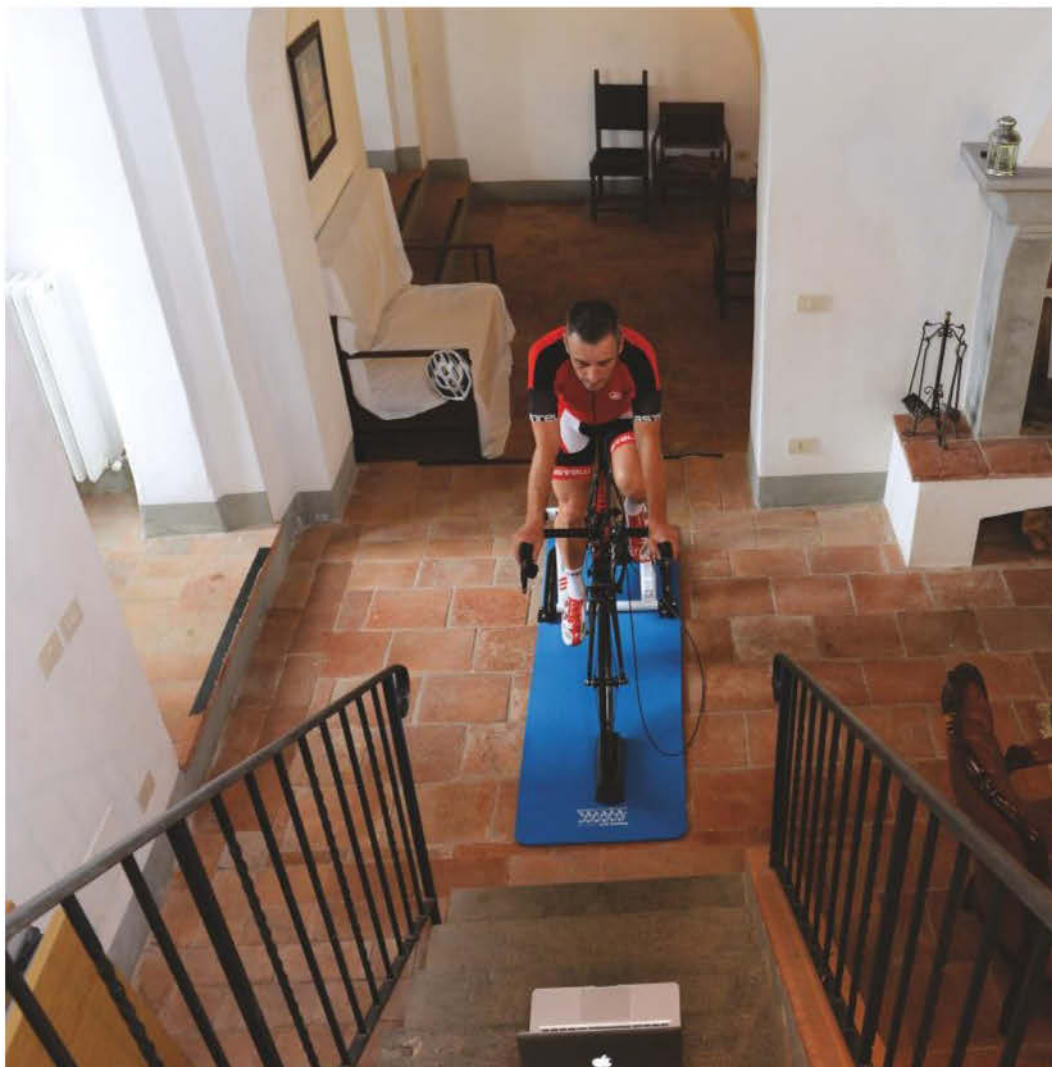
For cyclists, the golden rule is to keep indoor riding as road-realistic as possible. This might mean using the correct gear to obtain the right cadence and not continually standing up in the saddle, even if the instructor jumps up and down like a jack in the box.

"Some classes now include upper body work and a ridiculously high cadence," says Troutman. "My advice to road cyclists is that if you don't do it on your bike, don't do it in class."

TURBO-TRAINERS

They may lack the glamour of the Wattbike, but turbo-trainers are lower priced, portable and extremely convenient when bad weather sets in. It's only short stroll to the garage, kitchen or sitting room and you can train in your pants — a clear advantage.

There are a few downsides to turbo-trainers though (aside from someone ringing the doorbell). The main one is motivation. Riding on a turbo-trainer is a solitary affair. It will only appeal to those with the internal drive to push themselves, without relying on the camaraderie of either a group of outdoor riders or a yelling indoor cycling instructor.



"RIDING ON A TURBO IS A SOLITARY AFFAIR. IT WILL ONLY APPEAL TO THOSE WITH AN INTERNAL DRIVE TO PUSH THEMSELVES"

Videos are available which provide a ready-made workout or simulate classic race routes. These can be set up on a laptop or iPad to stave off the boredom of turbo-training.

Another downside of the turbo-trainer is the wear and tear of the back tyre caused by a combination of pressure, friction and heat. However, you can buy special tyres made of extra tough rubber just for turbo sessions. This does mean changing the back wheel every time you want to train, unless you are lucky enough to have an old bike that can sit on it permanently.

If you are thinking of buying your first turbo-trainer, you will need to first choose the type of resistance unit — the heart of the machine. The resistance is what gives the 'feel' to the turbo. A good one will feel more like riding on the open road. A bad one will feel a bit like marching on a stair simulator — clunky. Predictably, the more money you spend, the more lifelike the ride.

Having said that, if you only want a turbo to warm up before races, fold up and chuck in the back of the car then the cheaper options will do that job well. Resistance units fall under

TURBO-TRAINER CASE STUDY: PAUL WINKS

Paul Winks uses his turbo-trainer in the garage, garden, living room and even hotels when he is travelling to race. It's this convenience that he likes about them. "You can easily complete a 45-minute session and they pack away when you don't need them," he explains. "This is the beauty of a turbo-trainer. You also have complete control over the profile of your workout; there are no traffic lights or wind and you can ride in your Speedos — which I imagine would be frowned upon in the high street."

Winks owns a turbo-trainer with a magnetic flywheel (as opposed to liquid or air resistance). The model has non-adjustable resistance, because he found the adjustable model "clunky" and "unnatural" compared to road cycling. He uses his gears to shift through an interval session and tries to replicate and maintain positions he would like to hold on the road.

He completes two to three 45-60 minute sessions per week when training hard, but this drops to a single 60-minute ride during periods of base training. Winks also uses turbo-training time to focus on pedalling efficiency by practising one-legged drills and instilling a "controlled, constant cadence" that he hopes the body will naturally adopt on the road.

Winks believes that tinkering with cadence, pedalling or posture in this lab-like environment means he has the controllable aspects of riding nailed down by race day.

Any downsides? "They don't do anything for your bike handling, for which rollers would be better [see 'How to ride the rollers'] and they chew through rear tyres," says Winks. "It can also be all too easy on a foul winter's day to ride indoors in 21° Celsius than man up and get out there."





GETTING STARTED SETTING UP YOUR TURBO

1) Riser block This lifts the front wheel up in line with the back when it's locked into the trainer although some claim that an old copy of the Yellow Pages is a fine substitute.

2) Trainer mat A padded, plastic mat to reduce noise and vibration. This is essential if you have a loud air-based machine and/or first floor flat and want to remain on speaking terms with the neighbours. A mat

will also catch the inevitable torrent of sweat produced by using a turbo in a centrally heated house.

3) Media There are many apps and DVDs featuring either race footage or training programmes to make the turbo experience more stimulating. Try *Sufferfest* or *Spinervals* indoor cycling DVDs. For a turbo workouts in book form, try *Workouts in a Binder for Indoor Cycling* by Wes Hobson and Dirk Friel.

ROLLERS FANCY TRYING SOMETHING DIFFERENT?

Rollers improve balance, stability and pedalling technique and work the core in a way that turbo-trainers, Wattbikes or gym-based static bikes do not. The pros make it look easy. For the rest of us, here is a condensed guide to getting on, staying on and getting off without coming a cropper, courtesy of cyclist and blogger Michelle Arthurs-Brennan at www.ridewriterepeat.com.

- 1) Position the rollers and bike next to a solid object.
- 2) Clip one foot in, hold the back brake to steady yourself and clip the other foot in.
- 3) Hold onto the solid object with one hand and start to pedal.
- 4) Once up to a comfortable cadence, let go of your solid object. Put both hands on the handlebars. Look ahead. Pedal in smooth circles.
- 5) To stop, gradually slow down until you've almost come to a halt.
- 6) Place one hand on the solid object and give the back brake a squeeze with the other hand.
- 7) Unclick one foot and put it down. Do the same with the other.



the following categories: magnetic, fluid, air and direct drive.

1) Magnetic: a metal plate spins inside a magnetic field. The magnetic force can usually be increased to add resistance by clicking a switch mounted on the handlebars allowing you to tailor your workout.

2) Fluid: resistance is created by a propeller that spins inside a fluid filled chamber. These usually feature a cooling fan. Fluid resistance units usually feel smoother than magnetic trainers, and are quiet. They can, therefore, be more expensive.

3) Air: the cheapest option due to the noise produced. Like magnetic trainers, flicking a switch mounted on the handlebars can change the resistance on some air trainers.

4) Direct drive: the latest in turbo technology, the direct drive system requires you to remove the rear wheel and sit the rear drop-outs of the bike straight onto the turbo. This solves the issue of ruining rear tyres and creates a more stable and realistic ride. Direct drive turbos are also very quiet, but can be heavy and bulky and can be expensive.

MAXIMISE YOUR TRAINING PLAN





This is the time of year when cyclists diligently make training plans for next season. But how do you actually follow a plan and ensure you don't get lost along the way? *Dan Henchy* of PBscience explains how to get it right every time

"FAILING TO PLAN IS PLANNING TO FAIL"

If you have some lofty cycling goals for next season then I'm sure you've already considered coming up with a training plan to get you in shape for your target event. Countless books and websites are dedicated to the act of constructing a plan and the steps are familiar and well trodden.

First, set some goals. These should be SMART (Specific, Measurable, Attainable, Realistic, Time-orientated) if you want more chance of success.

Work out where you are now. This can mean doing some benchmarking, either timing yourself on a local circuit or hill, or making use of a power meter or lab test.

Finally, decide what training you have to do in the time you have available, to make sure you transform your current self into someone who has the capacity to hit those targets you've set for yourself.

If you haven't yet started thinking about next year then what follows isn't for you, yet. Sit down one evening or find an experienced friend or coach who can help you go through the above steps and construct a plan of action for next season. What follows is the bit that comes next.

COMPLIANCE

In an interview in the run-up to London 2012, Sir Dave Brailsford, the head of Team Sky and Team GB discussed how the number one thing that he looked for in his elite cyclists was what he described as *compliance*. Above anything else, the thing that Brailsford thought that separated the best from the rest was the fact that 99 per cent of the time they turned up and did the work in training.

This should be at the forefront of your mind when it comes to your training strategy. The simplest thing that you can do to ensure your success is to follow the plan. If you come up short of your goal but you missed one in three of your training sessions, the problem is with your compliance, not the training plan.

WHAT GETS MEASURED GETS MANAGED

If you're following a training plan, it stands to reason that you want

TOP TIPS FOR STICKING TO YOUR SCHEDULE

UNDER-SCHEDULE

Most people are guilty of expecting too much from their time. Perhaps you have an agreement from your partner that you can have eight hours a week to train. Don't schedule eight hours of ride time because by the time you've added 20 minutes to each session for getting ready and showering you're already up to 10 hours. Better to schedule six hours and treat anything else as a bonus.

KEEP A DIARY

Forcing yourself to record what you actually did versus what was in the plan gives a sense of accountability. The cyclists who get the best out of their training hate seeing 'zeros' so take pride in stringing together an unbroken streak of completed sessions.

TRAIN

FIRST THING

With evening training, if anything goes wrong during the day then your workout is always the thing that gets cut. Even if you can squeeze the session in it's likely shortened and sub-standard as the fatigue from a long day takes its toll. If consistency is a problem with your training, then schedule your workout first thing in the morning.

to improve at something. That's what separates training from simply exercising, or riding your bike purely for fun. To get the most out of your training plan, you need to get a handle on what that elusive thing is that you want to improve. Then you want to be able to quantify it; that way you can know if you're getting closer to your goal and judge the success of the training plan on this objective measure. There are two big reasons for doing this.

Positive feedback: there is no greater motivation when training than actually seeing the progress you're making. By keeping a track of 'the numbers', every time you find yourself struggling to get your cycling kit on, you can remember how well things are going and regain that spark. In fact, if things are visibly going well it's quite rare to struggle with motivation!

Negative feedback: of course it's not always the case that things go to plan. If you have a clear and frequent measure of success attached to your plan, you'll flag up quickly when things aren't improving, or worse, declining. Having said that you need to commit to completing the plan as your number one key to success, it's perhaps contradictory to then talk about changes but the key is timing. You should give the plan four to six weeks to see an improvement, but you'd be mad not to reassess if after that length of time there aren't signs that *something* has changed for the better. But what should that something be?

WHAT TO MEASURE

The key to measuring the success of your training plan is picking the right thing to measure. Sometimes this isn't as simple as it sounds but the answer always lies in the question: what is your goal? A few examples should illuminate this concept:

Weight loss/body composition:

probably one of the simplest examples, if weight loss is your goal, then you'd better make a regular weigh-in a key feature of your training plan. Once a week is sufficient, and make sure you weigh in at the same time on the same day each week so that the results are comparable.

You also need to think about the goal a little more closely. Many people say that weight loss is a goal, but maybe improved body composition is what they really mean. In that case it might also be worth including some measurements around key sites on your body to account for increases in muscle mass offsetting losses in body fat. A tape measure around the mid thigh, waist and chest is a good start point, but remember to measure at exactly the same position on the body each week.

Improve your sustainable power output: this is a goal for most

cyclists, whether it's expressed in this language or otherwise. You might also say, "I want to increase the average speed of my riding," or you may be targeting an assault on Alpe d'Huez or simply, "I want to get fitter," but in the context of endurance sports what you really want is to increase your sustainable power output.

A power meter offers the best metric to this end, with average power over 20 minutes the benchmark to look for. If you haven't got access to power, then a timed long climb gives another option or simply a timed loop but you have to take the results of this with a pinch of salt, as weather conditions can mask real changes in performance.

Improve your work capacity: this is perhaps not the sort of goal that immediately springs to mind but should be considered by all cyclists, particularly during the off-season. Cycling is a sport that rewards hard work. There are no shortcuts to getting out on your bike and getting the quality miles in if you want to improve. That's the reason the top pros complete 30-plus hour weeks on the bike, and why training camps can be such powerful tools for those looking for a boost in performance. However, you can't drop straight in to doing big weeks of training unless you've built up some work capacity.

Perhaps three hours of cycling leaves you exhausted at the moment but you want to build up to eight hours a week. It's quite obvious that time on the bike is a useful metric for tracking work capacity. Maybe you can already handle eight hours a week but only at an easy pace

TOP TIPS TO MAKE THE MOST OF YOUR PLAN

As you begin your off-season training, remember these three things to get the most out of your training plan

COMPLY
Follow the plan as closely as possible.

MEASURE
Keep track of what you're trying to improve so you know when to change plan and to maintain motivation when things are going well.

ADJUST
Get to know your body and how it responds to fatigue, and make adjustments on the fly depending on how you feel. The devil, as always, is in the details but if you follow these principles you'll get the most out of your training plan.

and you want to build the fitness to handle harder workouts. We need a measure of intensity here.

The simplest method is to give each workout a mark out of 1-10 for the effort required (session RPE as a sports scientist would call it). You can then multiply that number by the duration of your session to give a measure of load for the session. Add up the scores for each session during the week and you've got a metric that takes account of both training duration (volume) and intensity. One step further is using a power meter. There are a number of metrics that relate to training load using software such as Training Peaks or Golden Cheetah.

Once you've settled on the best metric and have a plan aimed at hitting your target 'numbers', then the final step is managing your training on a daily basis. When you write a training plan you have no way of knowing how you'll feel on a particular day several weeks in the future, so real time adjustments are needed to optimise the training load.

HOW TIRED IS TOO TIRED?

There will come a point in any training plan where you'll be struggling with fatigue, or unable to hit the required quality for your workout. Training *will* make you tired, the whole point is to break you down and rebuild you stronger, but how tired is too tired?

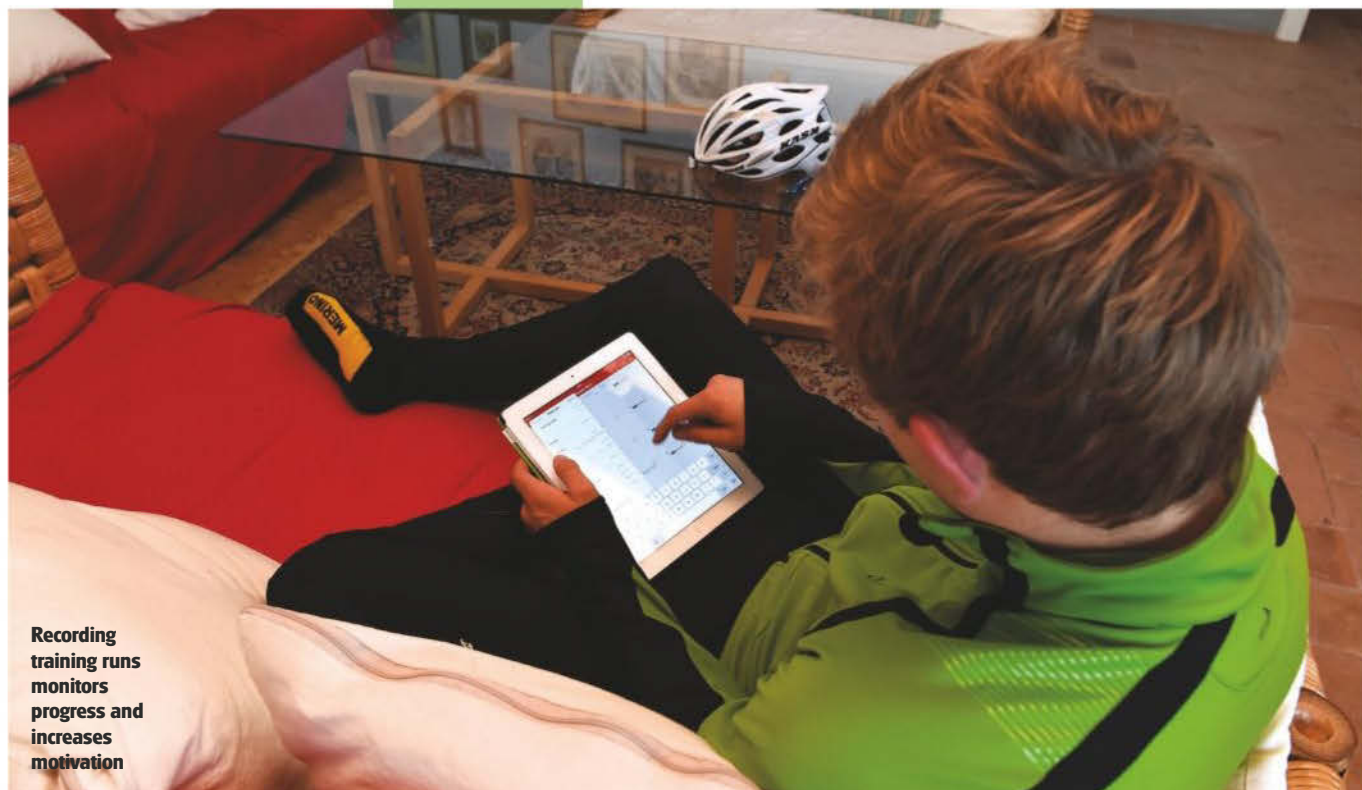
There's a bell curve response to training, which you need to be aware of. If you're never tired, you're probably not getting enough training

stimulus to see an improvement, and conversely if you're always tired and sore then there's a chance you're trying to cope with too high a training load. Somewhere between these extremes of under and over-doing it is that golden spot where the balance between training and recovery is in harmony, and progress is maximised.

As you can imagine with all the stresses that life can throw at you and your nutrition, sleep, recovery aids and everything else fighting against this, the subtle balance is hard to maintain and ever moving. How do we cope in practice?

The first piece of advice is always start your session and warm up. You can never tell how you're feeling until 10-15 minutes into your session. Some of the best sessions come when you've been rushed off your feet and feeling your worst, and conversely some of the worst fatigue can appear without warning and obvious cause. There's no harm in spinning your legs for 15 minutes and it's better to at least try rather than die wondering.

When things are out of alignment and you're feeling over-tired the first instinct is to drop the training load. It's worth remembering that there are other aspects that affect your level of fatigue, so consider whether you can do a better job with things such as sleep, ride nutrition, diet and stress management. If you're already tired then it's wise to back off the training to recover, but when you rejoin the plan make an extra effort with your recovery strategies to avoid any further detours.



Recording training runs monitors progress and increases motivation

HOW EXPERIENCED ARE YOU?

It can be useful to think about your level of experience as a cyclist. We're looking for the minimum effective dose to get our improvement, so use the following guidelines to help make a decision on when tired becomes too tired:

NOVICE

The great thing about the early stages of your cycling career is that the learning curve is steep. You can afford to have almost

complete recovery between sessions and still make excellent progress. If you find yourself tired for two sessions in a row, then take an easy period for as long as it takes to feel energised and ready to ride again.

INTERMEDIATE

You might graduate to this level after a couple of months or a couple of years. At this stage, most of the easy gains have been made and you might need to string together blocks of training to get the improvement you need. As such it's OK to be tired some

of the time, but only if you can still complete the training plan as intended. If you're forced to miss a key session or you feel tired for a week or so, then consider throttling back the training load.

EXPERIENCED

An experienced rider is one who has become attuned to their body to the extent they are familiar with what they can and can't handle. This only comes from having run through a number of training plans and made the mistakes that come from both under and overtraining. This is the Holy Grail!





WINTER RIDING

CAN DIGITAL
REPLACE
ANALOG?

Simon Schofield explores the fast-changing world of 'smart' turbo training

Let's call traditional winter training the Analog Method: wrap up warm and get out there. It's old-fashioned, but it works — a bit like an old record player. But just like Long Players have mutated into MP3s and streaming, winter training has been digitised. So let's call this the Digital Method: hook up the 'smart' turbo online and log on to a global race, ride a virtual Tour climb or subscribe to a serious training plan.

Here's a confession: I like turbo training. I look forward to the sessions and actively enjoy completing them. I know, you think that's weird. But though a good turbo session may not compare to flying down an alpine descent with the sun on your back and the wind in your hair, it is nonetheless rewarding. 'How so?' I hear you cry.

Quite simply, turbo training is one of the most accurate and effective methods of training, and the bang for your buck is biggest. But it's more than that. Indoor cycling is in the middle of a revolution. The new breed of 'smart' turbo is connected and competitive, integrated and immersive. This technology, alongside online racing communities, serious training programmes and turbos that accurately mimic efforts on the road, is brightening up the dark months.

"Many people think indoor riding is boring and not good for training. Both of those things are wrong," says David McQuillen, boss of leading training video company Sufferfest.

Of course, there's a but; in fact, there are a couple. Firstly, the expense of the tech: training with power using a structured programme will get the best from the turbo, while quality audio and visuals will motivate

you and ease your pain. Yes, that's going to cost a lot of money.

That said, the costs are coming down thanks to a host of new developments. Standalone power meters are dropping in price, as is the latest breed of power-equipped turbos. Also, many software providers have worked out a way of calculating virtual power using older-style turbos, ruling out the need for a power meter.

Companies specialising in indoor training are proliferating and providing everything from high-quality videos of cycling's holy places, to game-ified, competitive platforms in hyper-realistic virtual worlds, to training programmes that are so effective that they promise money back if you don't get fitter.

Perhaps most importantly of all, many of the companies working in this space are signing up to the benefits of open platforms and integration. What does this mean? It means that lots of different trainers will work with lots of different software, all talking to each other.

It can be a complex area, so we will break it down into various elements. As you'll see, mixing and matching can provide almost any combination of training, entertainment or engagement with fellow cyclists online. We have provided a few recommendations for combinations to provide real variety, interest and motivation to indoor training.

THE POWER OF POWER

To get the absolute best out of winter training on the turbo, power is where it's at. The ability to measure your output in watts means that structured sessions can be completed at the right level of exertion. Structured sessions, as long as they are



completed diligently, will make you faster and stronger.

Power is the best method of completing sessions because, unlike heart rate, it isn't skewed by uncontrollable variables. One hundred watts is always one hundred watts, whereas heart rate (HR) can spike up and down for a whole range of reasons.

The other vital aspect is regular testing of your power output and the best method here is Functional Threshold Power (FTP). There are several ways of calculating FTP, but in essence you complete a session that is your maximum sustainable power for a period of time, often 20 minutes. Take the average watts over the period and multiply it by 0.95. This is your FTP — the basis for all the sessions and it should be re-tested regularly.

Eddie Fletcher, sport scientist at Wattbike says: "I would say that a retest every four to six weeks is a good goal to aim for. It gives a focus to your training and means you can split it into blocks, hopefully charting improvements at the end of each block.

"Go into a test nicely rested and raring to go with a structured warm-up. We'd always make the last week of a block of training a lighter one."

So, given its importance, how do you effectively measure power on a turbo? There are three methods.

Use your power meter (PM):

Lash your best bike to the turbo and use whichever PM you have fitted.

Use a 'smart' turbo: A new generation of turbo is starting to appear — with an in-built, super-accurate power meter. The Wattbike has had this facility for a while, but it's expensive. The Wahoo Kickr is around half the price and is fast gaining most-wanted status for serious training on a turbo. It's rivalled by the CycleOps Power Beam Pro. We'll explain more in the hardware panel.

Use 'virtual power': Increasingly sophisticated software programs, used in conjunction with an ordinary trainer, are getting very clever at presenting what's called virtual power. It's calculated, rather than measured; the software takes your weight, speed, cadence and the resistance of the trainer into account and presents a number expressed in watts. This may not be spot-on accurate, but if it's consistent, it's almost as good as the real thing for training purposes.

HARDWARE

There are now two distinct types of turbo on the market.

'Smart' turbos are connected, using an ANT+ dongle plugged into your PC or tablet/phone or Bluetooth. These are resistance-controlled turbos. Used with a software program, the computer

ELITE REAL TURBO MUIN

RRP £1,099

This Italian company has a long track record in producing turbos, boasting of its products' quietness and ability to cope with super-human levels of power — up to a leg-breaking 3,500w. This top-drawer model has a very sophisticated drive unit that combines fluid and magnetics.

It's direct-drive, rear-wheel-off in operation. Build quality again is exceptional. This turbo will be capable of dishing out the pain for many years. It is another very heavy, almost over-engineered machine and, with the drives completely enclosed, it's neat and tidy.

It delivers on the quiet promise too. Even under big loads, this turbo is as close to silent as you are going to find with indoor cycling. There's some electronic buzzing as it adjusts resistance, but that's about it. Ride quality is also exceptionally smooth, particularly at low cadences. Road feel is perhaps not as accurate as it is on some turbos but, as we're cycling indoors, we don't feel this is a deal-breaker. Stability is not an issue — we would be surprised if even power monsters like Mark Cavendish or Chris Hoy could dislodge this turbo from its position.

Power calculation is via the 'virtual' method and, given the trainer's attributes, we expect complete consistency because its power curve can be accurately mapped, though it is difficult to validate its accuracy.

Like most high-end turbos, this is a resistance-controlled machine. Elite says the RealTurboMuin will simulate gradients of 18 per cent.

There is a lot to like but its 'closed' software platform is a bit clunky and non-intuitive and there is a noticeable time lag between the effort and the reaction on screen.



In this regard, it's the standout winner of the three. It's whisper-quiet. We could not coax it above 60dB, and much of that was chain noise.

BEST QUIET TRAINER

The Elite Real Turbo Muin wins this by a country mile. If the need to be silent is important, it's the one to have.

CYCLEOPS POWERBEAM PRO

RRP £765 (without head unit)

Because it's significantly cheaper than the Kickr, especially if bought without the Joule head unit (probably not needed for indoor training), we expected the Powerbeam to fall some way short of its Wahoo rival.

In fact, it doesn't. It's a wheel-on model, so you need to factor-in a training tyre. But this is a robust, very well-designed smart turbo from a company with an outstanding hardware heritage. Build-quality is again high; the turbo is rock-solid, despite its relatively minimalist design. It folds quickly and easily, reducing storage space if you don't have a permanent pain cave.

The clincher for many when choosing between the Powerbeam and the Kickr will be the presence or absence of an integrated power meter, where CycleOps has made the decision more difficult. The Powerbeam is ANT+ enabled and on an open platform, so it 'talks' to lots of other training software. It has a clever ratchet-and-click mechanism for ensuring that pressure on the rear tyre is always uniform.

Assuming you keep tyre pressure consistent, this turbo should be a very predictable machine. It can be calibrated, every time you ride if you wish, using a simple roll-down test. All of which means that 'virtual power' readings will be very close indeed to the actual power output — and should be very consistent, which is critical for a serious training programme.

In our tests — which we cannot claim to be scientific — we could not perceive a difference between power generated when using the Kickr and when using the Powerbeam (riding the same program on Trainer Road). Subjective, of course, but we noticed no difference.

The bundled software, Virtual Training, is improving fast and is becoming a feature-laden, integrated training portal. You can ride Sufferfest videos synchronised with your FTP, create your own training plans, or ride videos, some of which are professionally shot. Cycle Ops is promising regular updates and frequent new features. You aren't tied to their software package, though it boasts many of the features that can be found elsewhere. Impressive.



The Powerbeam is relatively quiet. We clocked it at a peak of 66dB, which is far from intrusive.

determines the level of resistance of your turbo. Going uphill is harder. Pushing at 100 per cent of your FTP? The trainer will provide enough resistance to achieve it.

The second, older type of trainer is fast becoming known, rather unfortunately, as a 'dumb' turbo, since this type is neither connectable to the internet or your PC nor can its resistance be controlled by software.

But the good news is that software companies have established how many of these trainers behave, in resistance terms, by testing them. With speed and cadence sensors and an ANT+ dongle attached, they can be used profitably on many of the training platforms or in virtual worlds and online races.

We have tested three of the leading 'smart' turbos. These are expensive and represent a very

significant investment in your training, but if the build-quality and functionality is good, they should last many years. If you are really serious about training indoors, the high price may be worth paying. The cost of a smart turbo will work out at roughly the same as a week-long spring training camp.

Some will have bundled software programs, though the growing trend is for the trainers to be 'open platform', meaning you can use them to plug into any compatible turbo software.

VISUALS

There are three different types of visuals for smart indoor training, each with pros and cons. Riders can alternate the types to prevent boredom and achieve the training effect they're seeking.



TURBO REVIEWS

TRAINING

Can digital training replace analog?



BEST OVERALL SMART TRAINER

Because it's got an integrated power meter, the Kickr is hard to beat. It's an awesome training tool. The Powerbeam Pro runs it a close second.

WAHOO KICKR RRP £94999

Built to last — seemingly from girders — this weighty beast is one of the best options in smart trainers... if you're prepared to pay the price. Two factors make it highly desirable: the built-in power meter and the fact that Wahoo has chosen to go with an open platform. In non-geek speak, this means it will connect with just about every other training software available, making it an extremely flexible piece of machinery.

It is anything but flexible, physically. The unit is seriously robust. You take the back wheel off the bike and hook up to the double-flywheel direct drive system. The Kickr comes with a

10-speed cassette, which can be changed. This contributes to a very smooth ride, which feels road-like and natural, even at high resistance. The build quality is outstanding, but it's not the kind of turbo that you would easily stash in the car for a pre-race warm-up. This baby is heavy — around 50lb.


There are several modes, but most will go for Erg Mode, in which the software will instruct the trainer to create the resistance that meets a power target, whatever the rider does. So if you need to hit 200w, you can do it spinning at 100rpm or 60rpm.

It is ANT+ and Bluetooth-enabled and will work with desktop programs as well as iOS and Android platforms.

It comes without a software package, other

than the very basic Wahoo Fitness app, which can control the resistance. But most will want Kickr as an entry point to the exciting third-party software options.

It is expensive, which some will find off-putting. But it is looking pretty future-proof and it has changed the game, making possible serious indoor, power-based training across a wide range of options. Some people will think that's a price worth paying.

 The one downside to the Kickr is that it's quite noisy. We clocked it at 85dB, which is in the normal range for turbos. But when wound up, the noise is quite high-pitched, and some will find it intrusive. This can be mitigated by adjusting cadence and gearing.



Turbo training sessions can mimic efforts on the road

Real footage: The visuals here are dominated by the 'holy places' of cycling, like the big Tour de France climbs, the Belgian Classics, Giro and Vuelta stages and many other roads where riding a bike offers either a beautiful or a redolent-with-history panorama. It is possible to pretend that you are riding almost anywhere in the world.

The professional films are almost always shot on blue-sky days, except in Belgium, and some are shot in pin-sharp HD and will use specialised, stabilised cameras.

The other main type of video is user-generated, shot by cyclists from the bars or helmet using an action camera. The quality is in some cases pretty much unwatchable, though in others it's surprisingly good. The videos are encoded in such a way that, on a resistance-controlled

trainer, when the road goes up, the resistance increases.

In an ideal world, resistance increases in sync with and in proportion to the topography. So when a four per cent gradient becomes a 10 per cent brute, the resistance changes as you would expect as the scene unfolds. The professionally-shot videos, as a rule, get this right. The user-generated footage is less reliable and you can be apparently cruising downhill while mashing away in 39-25.

In all cases, your ride stats — heart-rate, power, cadence and many other metrics — will be overlaid onto the video.

User-generated video: Virtual Training (CycleOps), Bkool Real Video (Elite and Kinomap).

Everything except Kinomap, which is a standalone subscription service, ▶

VISUAL REVIEWS

VELOREALITY

RRP: \$14.38 per video

This Canadian company specialises in providing the highest-quality videos; the definition and stability of the picture is stunning. As a result, downloads are huge. But if you train in front of a big screen, these videos are highly recommended. This year the collection will increase to 65 videos.

The software is no-frills but works flawlessly. It detected our Wahoo Kickr without missing a beat and without any intervention from the user. At present, the amount of effort is largely left to the user, so you decide how hard you want to go up a climb or through a valley. But previous rides are recorded and can be used as pacers — you can race yourself next time.

The company has big plans. It is going to introduce internet racing, which for the competitive types can transform a turbo session from a chore to an eagerly awaited event. Veloreality is also introducing structured workouts during the video with virtual partners — another big tick for motivation.

BEST VIDEO

The outstanding quality of the VeloReality videos, and their reasonable price compared to some others, make them our first choice.

BEST TRAINING SOFTWARE

TrainerRoad quite simply makes every second you spend on the turbo count. For structured training that you don't have to think about designing yourself, it's unbeatable.

BEST NEWCOMER

Zwift looks to be a really serious proposition and it could be transformative for indoor riding. It needs a critical mass of users to be successful but the early signs are promising.

TRAINER ROAD

\$10 per month

This American company has almost cult-like status. For \$10 a month, you get access to its training programmes, which are massively varied and devised in league with a certified coach. If you want to train for a specific event such as a 40km time trial, there's a programme for that. If you have just a few hours a week spare to train, you can choose a tailored time-efficient programme. You can do Team Sky's time trial warm-up or you can devise your own custom set of intervals.

All the sessions are power-based, and the system is capable of integration with the Sufferfest series of training videos, which means you don't have to put up with a screen full of numbers to hit.

ZWIFT

\$10 per month
from January 2015

The standout new entrant in the virtual visuals world is Zwift. Due to be launched fully in January, the company claims that it will revolutionise indoor training. The big ideas are "hyper-realistic" environments and a big social aspect. So you will enter Zwift world and pick up other riders for a group thrash, or a race up a climb or through the sprint points.

This is going to be made possible, Zwift says, by ensuring the platform will

talk to just about any halfway decent turbo trainer, either 'smart' or 'dumb', provided it is running on a PC that's less than three years old. Dumb trainers will need sensors and an ANT+ dongle.

Zwift CEO Eric Min is a keen indoor cyclist: "Zwift has been in development for seven years. We are well-funded; we have people from the games industry and event management involved. We are seasoned entrepreneurs and we know what we are doing. We really believe we can re-invent indoor cycling."

Time will tell whether Zwift catches on. The signs so far are good, though.

is a software platform that comes bundled with a trainer, and all feature user-generated video, among other visuals. It's worth noting that BKool has opted for a closed system; its videos work only with its trainers, and it is also subscription-based.

The problem with user-generated video is that it varies widely in quality, and even the high-quality material is a long way short of the professionally-shot videos. The GPS tracks can be patchy too, meaning you feel like you're going uphill when, visually, it appears that you're doing the opposite.

However, if your virtual training is phone, tablet or laptop-based, then the quality is far less of an issue. But it's always a shame to see a beautiful landscape framed by a set of levers or wildly rotating from side to side as a rider pushes hard up a climb.

VIRTUAL ENVIRONMENTS

Tacx pioneered this approach, but others have now caught up.

One new entrant has a stunning, ultra-realistic offering. You ride around in a virtual world with lakes, hills, bridges, hot air balloons, forests and tons of other landscape features

in an animated representation of reality. Avatars and fellow riders can accompany you — or more likely race or pace you. In some programs, you can customise your own rider with a variety of kit.

WORKOUT INTERVALS

Many of the bundled software programs contain options aimed at the serious training market. These are interval sessions, many based on FTP. There are options to create your own training programmes or to devise your own plan. The leader of the pack however, is TrainerRoad,



SUFFERFEST

RRP: \$12-\$14 per video

The Australian company sets itself apart by using footage mainly of pro cyclists nailing it on a sprint or hammering up a climb, all set to motivational tunes. The USP is that Sufferfest has configured the video as a training session, with on-screen graphics urging you to nail it or hammer it like the pros in interval sessions. It's all done with a unique brand of humour in the world of 'Sufferlandria'.

Sufferfest uses "rate of perceived effort" (RPE) — you are encouraged to give it five out of 10 in recovery or 10 out of 10 in a sprint. The workouts are compiled using a coach, and are endorsed by sports scientists.

Although Sufferfest can, and is, used on 'dumb' trainers, the really interesting option is its integration with smart trainers and other software programmes like Trainer Road. The numbers change from RPE (estimated effort) to properly calculated intervals using power matched to the visuals and calculated to your specific FTP — making it a precise, accurate and fully structured training tool.

Chief Sufferlandrian David McQuillan told *CF*: "The trick is to get the user to be engaged, motivated, working hard, and importantly doing it again and again."

Sufferfest is introducing onboard camera footage in its new videos and is re-mastering some of the old ones to make them HD.

There was huge demand to join its beta testing programme — some 13,000 inhabitants of pain caves applied.

CF was given very early access to Zwift. Our first impressions were good. The complexity that can dog these systems was absent and the platform looks like it will deliver on the immersive, entertainment-focused experience it promises.

Min says that riders who want to train seriously will not be ignored, and later releases will feature structured training programmes. One to watch.

a stand-alone platform that talks to many smart and dumb turbos and offers hundreds of workouts and dozens of plans.

If you're a real by-the-numbers kind of rider and want to maximise every second of your turbo time, TrainerRoad is hard to beat. The user interface is slick, professional and easy to navigate. Tech support is first-class; we had a query answered within hours, with an unsolicited follow-up email checking that we had the solution. It's yet more expense, but it's an excellent tool for the serious cyclist who is goal-focused.

THERE IS STILL A PLACE FOR ANALOG

Hannah Reynolds, editor, *Cycling Fitness*

"Simon makes a persuasive case for the Digital Method, but I want to speak up for the old school. Cycling is about riding your bike, out in the fresh air, on the road and all year round. The people I admire the most are the Belgian hardmen and women who not only ride out all winter but do it without compromise to the elements — without gloves!

"OK, that might be pushing things a bit far but the principle appeals to me. Riding your bike is all about getting out, not being confined by four walls and staring at some digital representation of the real thing. I'm no Luddite and I'm not advocating needless suffering in the cold and the rain. The technical advances in clothing and equipment can mitigate much of the worst the British winter can hurl in your direction, and that means an outdoor ride is always worthwhile, no matter how foul the weather.

"Some of my most memorable rides have been in winter conditions. Cold, clean air, a low winter sun, frost glittering on the hedgerows — it can all make for magical riding. Even the dark holds little fear for me. A really good set of lights, proper clothing and a bike set up to combat winter puts you in a bubble. Distractions are removed; it's just you, the bike, your breathing and the ride.

"Getting back home tired and cold but somehow fulfilled by your triumph over adversity to be greeted by a warm fire, a cup of tea and a big bowl of porridge just makes you feel good. And you don't get that climbing off a turbo!"

**"CYCLING IS ABOUT
RIDING YOUR BIKE,
OUT IN THE FRESH AIR,
ON THE ROAD AND ALL
YEAR ROUND"**



CHANGE THE SCENERY & UP YOUR MILES

Winter training camps are suitable for cyclists of all levels. *John Walsh* assesses the popular European destinations for their climate and climbs

HHeading to mountainous mainland Europe for a week or two during the winter allows you to rack up some sunny, fitness-boosting miles to keep your motivation high while the weather back home is beastly.

One of the most appealing things about going on a training camp, beyond the warm weather, is the chance to ride some 'real' climbs. If you live in a relatively flat area, the opportunity to test your climbing legs is high on the list of attractions when choosing a destination.

Training camps were once the preserve of professional athletes and committed amateur racers, but increasingly cyclists of all levels are packing their bike bags in search of some winter sunshine and some warm training miles. And why not?

When the weather is hideous at home, it gives you something to look forward to, a reason to keep your cycling fitness. And when you are out there, it's a way of topping up or boosting the fitness benefits you have already accrued. When you are slogging away on the turbo, staring at the garage door and listening to the rain coming down, the thought of powering up a sunny climb is a good way of keeping motivated.

When choosing your training camp destination, lots of factors come into play. Weather is obviously critical. Majorca, for instance, often has torrential rain and even snow in January and February, but is usually glorious by mid-March.

The type of camp and its cost are also important considerations. They range from the highly organised — with personal coaching, led rides, evening seminars, massage and gym sessions — to the more casual, where the emphasis is on simply knocking out as many miles as possible in the sun. Another decider is the riding itself — and in particular the climbing. We've looked at some of the most popular training camp destinations and their key climbs.



NICE

Nice, like Girona, has so much going for it that some pro riders have set up home here. Facing on to the Côte d'Azur, the sparkling Med and lively old town means there are plenty of places to hang out once your riding is done, and a gentle cruise along the Promenade des Anglais for some people-watching is a popular way to finish rides.

Nice is where the Alps meet the sea; it is a good road riding destination all year round but cooler temperatures in winter may limit you to some of the lower climbs. Even so, by March it will be comfortably warm so it's a good choice in spring and early summer.



COL D'EZE

Nice is a busy town, but it doesn't take long to get out onto quieter roads, and into the mountains. The Col d'Eze starts even before you leave Nice; it's 10km long with an average gradient of five per cent, including some slightly steeper sections. It yields spectacular views over Nice and the Mediterranean. Naturally, this col attracts a relatively large number of riders but it is just one of the many climbs in the area.

A longer ride along the coast toward Italy would allow you to test yourself on the Col de la Madone, or head north-west for the beautiful Col de Vence.



MOJACAR, ALMERIA, SPAIN

Mainland Spain offers a more reliable climate than Majorca and it is a safer bet during January and February. Mojacar is on the coast, but turn inland and it quickly becomes hilly and barren. It doesn't offer a huge amount of opportunity for flat recovery rides but it will provide plenty of chances to test yourself and build endurance.

The area around Mojacar has been used by the Belkin pro team for their training camps in the last few years. Many of the roads are virtually traffic-free and you certainly won't get the giant pelotons of riders that can fill the roads in Majorca. Head to the coast road near Mojacar or into the old town and you will find plenty of opportunities for cake and cafe culture to replenish the calories expended in the hills.



CARBONERAS

The Sierra Cabrera mountain range offers a wide possibility of climbs so you can weave up and down, accumulating a vast amount of total altitude throughout your ride. The climb to Carboneras from Mojacar is a popular test climb and one not to miss. It is not a continuous gradient, and the patches of respite allow you to push on harder elsewhere.

GRAN CANARIA

With more variety of riding than Tenerife, and less wind than Lanzarote, Gran Canaria is becoming one of the most popular islands for winter cycling camps. There is a lot of climbing and very little flat, but there are a few different climbs to choose from, and the coastal roads have beautiful views out to sea to distract you from the relentlessly rolling terrain. The toughest ride of all is the 200km round-the-island loop.



PICO DE LAS NIEVES

The highest point on Gran Canaria, at 1,915m. You can see Mount Teide from the summit. The summit can be approached in several different ways. The toughest is starting from Carrizal, from where the ascent is 26.7km long, climbing 1,835m with an average gradient of 6.9 per cent.

A longer approach is from Maspalomas; this is 42km long and climbs 1,855m with a slightly easier gradient of 4.4 per cent, not including its slight downhill (it's a two-part climb from this direction). If you want a lot of miles and tough climbing, you will find it in Gran Canaria.



MAJORCA

Majorca is one of the original training camp destinations, and pro teams have been heading there since the Eighties. It has become so popular that in many ways it has become a victim of its own success, with huge trains of riders filling the road and mobbing the cafes. For British riders, it's virtually a home from home; they return year after year to ride the same roads. Hanging out at Tolos Bar is also a large part of the experience; with so many other Brits out there, you are bound to bump into someone else you know.

Majorca is the easy choice. There is great infrastructure for cyclists, loads of great bike shops, and being surrounded by so many other bike riders is for many part of the appeal. There is a good variety of terrain, with flat coastal rides to mountain passes. The Puig Major is the highest, at 854m, and

it can be climbed over 14km by starting almost at sea level.



SA CALOBRA

Sa Calobra is the climb that draws riders back year after year. It has a Scalextric-style layout of 26 hairpins that weave around and over the top of each other, making for exhilarating climbing and descending. The descent comes first, as you plunge your way down to a small, secluded cove with just a handful of restaurants. When you reach the bottom, there is no way out other than to climb back up the way you have come. With a fairly constant gradient of around seven per cent, you can push yourself hard. Many riders use it for interval training. Joanna Rowsell told *Cycling Fitness* that she climbed the whole way doing 10 seconds hard followed by 20 seconds easy as a British Cycling training camp session.

GIRONA, SPAIN

Though not a year-round destination, Girona is the place to which many pro riders head early in the race season once the temperatures start to rise. They favour the climbing, climate and culture; indeed, some have found it so desirable that they have settled here.

From mid-March, the temperature starts to rise toward the high teens and by May it is comfortably in the low-20s. Unlike the more touristy destinations of Majorca and Tenerife, which tend to be quiet except for cyclists during the winter, Girona is lively all year round. A university ensures that the town is always vibrant, with plenty of good bars and the all-important cafe culture for lazing around post-ride.

One of the reasons this area has provided a good base for full-time riders is that there is plenty of varied terrain. Flat cruises along coastal routes allow for recovery rides with the option of longer, more challenging rides into the mountains. In a two-week camp, you will be able to avoid riding the same roads if you plan your routes carefully.



ROCACORBA

The 10km climb of Rocacorba is the one used locally as a fitness test. Its average gradient is seven per cent but in places reaches as much as 15 per cent. If you fancy laying down your own marker here, you will be sharing the Strava leaderboard with many famous names — just don't expect to score a KOM here.





TENERIFE

Tenerife has boomed in popularity since reports of Team Sky training camps on the island. It certainly has a lot to offer the dedicated rider. Mount Teide dominates the island's skyline; the cone of the now extinct volcano tops out at 3,718m, and the road summit is nearly 2,200m. The advantage offered by this climb is that you can ride up it from sea level, so you can ascend the full 2,200m in one continuous climb.

Because Mount Teide is such a dominant feature of the island, it is harder to find variation in your rides — not that it mattered to Team Sky, who spent much of their camps knocking out intervals of between 1,500m and 2,000m. It is an all-winter destination, comfortably warm enough to ride in shorts, even in January. It's a fantastic destination for the already fit rider who wants to focus on specific training and really stretch their climbing ability. On the other hand, it may not suit those looking for a more varied or relaxed cycling holiday.



MOUNT TEIDE

Start at sea level and conquer the climb in one ride. Gradients vary between five and seven per cent, so it is not particularly steep but it is continuous. You will need to exert yourself for the entire duration. For reasonably fit riders, this challenging route from sea to summit will take around 2.5 to three hours. When you reach the top, you will see the hotel favoured by Team Sky (which allowed them to sleep at altitude during their training).

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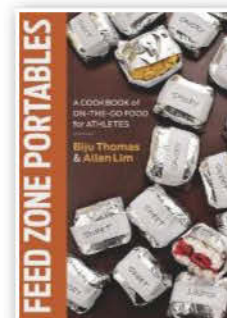
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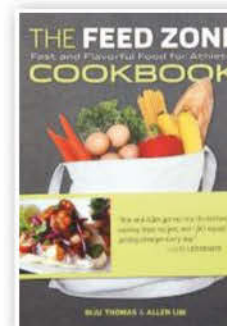
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NUTRITION

Winter weight gain is an expected part of the Christmas party season. There is a tendency to put 'lose weight' on the January to-do list even as we are piling in the sausage rolls and knocking back the sherries.

We look at some popular diets that you might be considering for the new year, to work out which is best for bike riders. If you are planning to take part in long endurance events for 2015, it's time to start thinking about fat; not the belly overhanging your jeans but how you can train your body to be more efficient at burning fat.

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Just because they work for celebrities doesn't mean they will work for cyclists



P80 BOOZE AND BIKE RIDING

Nothing beats a cold beer after a long hard ride but does it do you any good?



PLUS...

P76 EAT FAT, RIDE LONGER

It may sound odd but the more fat you eat in your diet, the more able you are to burn it on your ride

P84 WINTER RECIPES

Tasty, warming and nutritious, these seasonal recipes are perfect cold-weather fuel



WEIGHT LOSS BATTLE OF THE DIETS

Weight loss has always been a hot topic among cyclists. Forget spending money on getting a lighter bike — trimming excess body fat is the fastest way to improve your performance. From juice fasts to the paleo diet, dietitian *Laura Tilt* talks the pros and cons of popular weight loss plans. Do any of these diets work, and if they do, what difference to do they make to your performance on the bike?

MOST WEB-SEARCHED DIETS

According to Google's zeitgeist report, Paleo topped the poll for most searched diet last year, closely followed by the juice cleanse and ketogenic diet

DIET 1

GLUTEN-FREE

The only medically accepted reason to eliminate gluten is coeliac disease, but it's become a trendy way to shed pounds. Found in wheat, rye and barley, gluten is the protein that gives bread its springy texture. Gluten-free diets exclude all cereals containing gluten, which means no wheat, rye or barley-based bread, pasta, biscuits, cake and breakfast cereal.

Naturally gluten-free foods include fruit, vegetables, dairy, meats plus gluten-free carbohydrates such as rice, potato and quinoa.

DOES IT ACTUALLY WORK? There's no evidence that avoiding gluten will help you lose weight. As a side effect of avoiding gluten, you may eat fewer processed foods or carbohydrates, which will probably cut your calorie intake.

PROS Most of us eat a lot of wheat-based foods, so adding other grains will make your diet more varied. If you suffer with irritable bowel syndrome there's evidence that you might benefit from eating less wheat — but this is down to certain groups of fermentable sugars in wheat, rather than the gluten component.

WHAT'S THE DOWNSIDE? Gluten-free doesn't mean healthy. Statistics from the US show half of new gluten-free sales are snack foods, most of which contain as much (if not more) sugar, salt and fat as the gluten-containing versions.

CF

RATING



If you think you have coeliac disease, seek advice from your GP or a dietitian before you cut it out.



DIET 2

LOW CARB HIGH FAT

Popularised in the Seventies, Dr Atkins left a lasting legacy with his low-carb approach to weight loss. If you've ever tried the Atkins diet you'll know the induction phase is tough — carbohydrate is restricted to less than 30 grams a day, which is a banana's worth. On the upside you can eat unlimited meat, fish, oils and full-fat dairy. Once induction is complete, carbohydrates are slowly increased by five grams a week until weight stabilises.

More recently, low-carb, high-fat diets have become popular with endurance athletes as a way of encouraging the body to rely on fat for energy, sparing carbohydrate stores.



DOES IT ACTUALLY WORK? Low-carb diets tend to result in better weight loss than low-fat diets, at least initially. After 12 months, differences dwindle, which suggests that sticking to this long-term is challenging. Part of the problem is working out what low carb really is — depending on who you talk to, it can mean anything from less than 30 grams a day, up to 40 per cent of your calories.

One thing's for sure — there's no magic around low-carb diets. They work because they cut the number of calories you eat. Another plus is the impact on appetite — dieters eating fewer carbs usually wind up eating more protein, which stops you feeling hungry.

As for endurance performance, the jury is out. Low-carb, high-fat diets do increase the amount of fat the body burns for energy, but this doesn't mean better performance. In a recent study from the Human Performance Laboratory in Poland, male cyclists following a low-carb, high-fat diet lost body fat, but their power output at maximal intensity suffered.

PROS Better weight loss, at least initially, which can be motivating. Less sugar and refined carbohydrates isn't a bad thing and more protein can stop you feeling hungry.

WHAT'S THE DOWNSIDE? Long-term, a strict low carb is hard to stick to, affecting mood and the ability to train hard. Constipation and bad breath are also common.

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RATING



Save lower-carb diets for the off-season, when low-intensity training dominates.

DIET 3

LOW FAT DIET

Fat contains twice the calories of carbohydrate or protein, which has made it the focus for most weight loss plans over the last 20 years. This means replacing full-fat dairy and fatty meats with more cereals, bread and low-fat dairy, lean meats, fruit and vegetables.

Unfortunately low fat can mean high sugar, especially when it comes to processed foods like breakfast cereals and snack bars.

DOES IT ACTUALLY WORK? Despite most authorities recommending low-fat diets, the results aren't good. Low-carb and Mediterranean eating patterns tend to outperform low-fat diets for weight loss, at least in the short-term. Results from the Women's Health Initiative study found advice to follow a low-fat diet didn't translate to any benefits on body weight, cancer or heart disease risk.

PROS Low-fat diets tend to be higher in carbohydrate, which, if chosen correctly, can benefit high-intensity rides. You're best off cutting your intake of pastries, cakes, processed meats and fried food but saving eggs, nuts, olive oil and oily fish.

WHAT'S THE DOWNSIDE? Fat isn't bad; you need some to absorb vitamins, make hormones and keep cell membranes healthy. Plus it makes food taste good — sticking to a cardboard diet isn't nice.

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RATING



If you opt in, make sure the carbs you choose are high in fibre.



DIET 4

CALORIE COUNTING
-MYFITNESSPAL

If you don't want to follow a set diet plan, keeping track of your intake with an app like My Fitness Pal is a good alternative. Simply log what you eat by searching the food database and the app will calculate your calorie intake against a personalised target, which is gauged by your age, height, weight and activity levels.

DOES IT ACTUALLY WORK? If you stick with the recommended target, then yes. The act of recording what you eat has also been proven to be helpful — in one 2008 study, US researchers at the Kaiser Permanente Center found dieters who recorded their intake doubled their weight loss. By doing so, you automatically become more aware of your eating habits, and start making better choices.

PROS An effective way of getting to grips with exactly how many calories you're consuming and where you can cut down.

WHAT'S THE DOWNSIDE? Logging your intake on a daily basis can get boring. Calorie counting also says nothing about the quality of your diet — you can still choose to eat junk.

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RATING



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DIET 5 PALEO

The Paleo diet claims to mimic that of our caveman ancestors — so no grains, sugar, legumes, dairy, booze or processed food. Instead you can enjoy unprocessed meat and fish, eggs, non-starchy vegetables, nuts and berries.

Made popular by professor of exercise physiology Loren Cordain, fans of the diet claim that our bodies haven't evolved to allow us to eat grains, with most of our public health problems (obesity, diabetes and heart disease) linked to modern-day eating habits.

DOES IT ACTUALLY WORK?

Research is limited, but a few short-term studies have found benefits for blood pressure, cholesterol levels and inflammation. Much like low-carb diets, there's no magic pill — by limiting food groups, you wind up eating fewer calories.

PROS More fresh food, less processed food and an emphasis on fruits, vegetables and healthy fat.

WHAT'S THE DOWNSIDE? Paleo does tend to be low in carbohydrate, which will have a knock-on effect on your ability to train hard. Food groups are severely limited, and there's no good evidence to suggest we need to ditch all grains.



Add sweet potato and yams, root vegetable and fruit when cycling.



DIET 6 LOW G.I.

Glycemic index (or GI) is a measure of how carbohydrate-containing foods raise blood sugar. High-GI foods include white bread, cornflakes, and white rice — these are rapidly digested and raise blood sugar quickly. Low-GI foods like rye bread, beans, sweet potatoes and oats are digested slowly, giving a sustained release of energy.

DOES IT ACTUALLY WORK?

Low-GI carbs do seem to be better for controlling hunger — in a 2009 study from King's College, researchers found a low-GI breakfast led to higher levels of the 'fullness' hormone GLP-1 than a high-GI breakfast of the same calories. In another study led by Harvard Medical School, a low GI diet beat a low-carb or low-fat diet for maintaining weight loss in the long-term.

PROS More satiating and easier to stick to than a very low-carb diet. Studies also show low-GI carbs may boost endurance performance. In one 2010 study, male cyclists consuming a low-GI breakfast performed better in a 40km TT than those consuming a high-GI breakfast.

WHAT'S THE DOWNSIDE? GI isn't perfect. Some foods like ice cream and chocolate cake end up being low GI because the fat content slows digestion.



A balanced approach to weight loss and blood sugar control.



DIET 7 JUICE FAST

The second most searched for diet of 2013, a juice fast involves replacing all solid foods with vegetable and fruit juice. Although it can last for up to 30 days, most proponents recommend a five-10 day period of juicing. During this time all of your calories and fluids come from either juice or water.

DOES IT ACTUALLY WORK?

Although juice diets are rumoured to be popular with professional cyclists, there's no good evidence to support them for maintaining weight loss in the long-term. You'll certainly cut your calorie intake (with most 'plans' containing around 1,200 calories of juice a day) and you'll lose water weight as your glycogen stores are used up.

PROS Juice isn't all bad news for cyclists. Beetroot juice taken before exercise has been shown to boost performance and both cherry and tomato juice can improve recovery by reducing muscle damage. Team Sky is a fan of fresh juice, as a way of boosting fluid and antioxidant intake, without added bulk — but this is done alongside a balanced diet.

WHAT'S THE DOWNSIDE? Severely restricting calories and carbohydrate will affect your ability to train hard, and a lack of protein will limit your body's ability to maintain muscle tissue. Doing this long-term is likely to leave you deficient in a number of important nutrients and will increase lean muscle loss.



Not advisable for any prolonged period — there are better ways to lose weight.



DIET 8 INTERMITTENT FASTING 5:2

If you haven't tried the 5:2 you probably know someone who has. The 5:2 involves alternating days of 'normal eating' with fast days, where you consume no more than 25 per cent of your normal intake — that's 600 calories for men and 500 for women.

DOES IT ACTUALLY WORK? Trials are limited but positive. Researchers at the Genesis Centre in the UK found two days of intermittent fasting was more effective than daily calorie restriction at lowering body fat and insulin levels in women. American studies have shown similar results — in one 10-week trial, subjects lost around 6kg, with almost 90 per cent of people sticking with fast days.

PROS Weight loss is as good as if you cut calories on a daily basis, plus there may be extra benefit on insulin control and inflammation.

WHAT'S THE DOWNSIDE? Training after a fast day (or the morning after) is challenging. There's also no real guide on the ideal pattern of fasting, or how you should spend your calories.



Worth a try if the idea of dieting seven days a week is more than you can bear.





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Sunday 29th March

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Saturday 2nd May

South Downs Spring

Plumpton Racecourse, Sussex
Sunday 17th May

The Arrow

Market Rasen Racecourse, Lincolnshire
Sunday 31st May

Ripon Revolution

Ripon Racecourse, Yorkshire
Sunday 28th June

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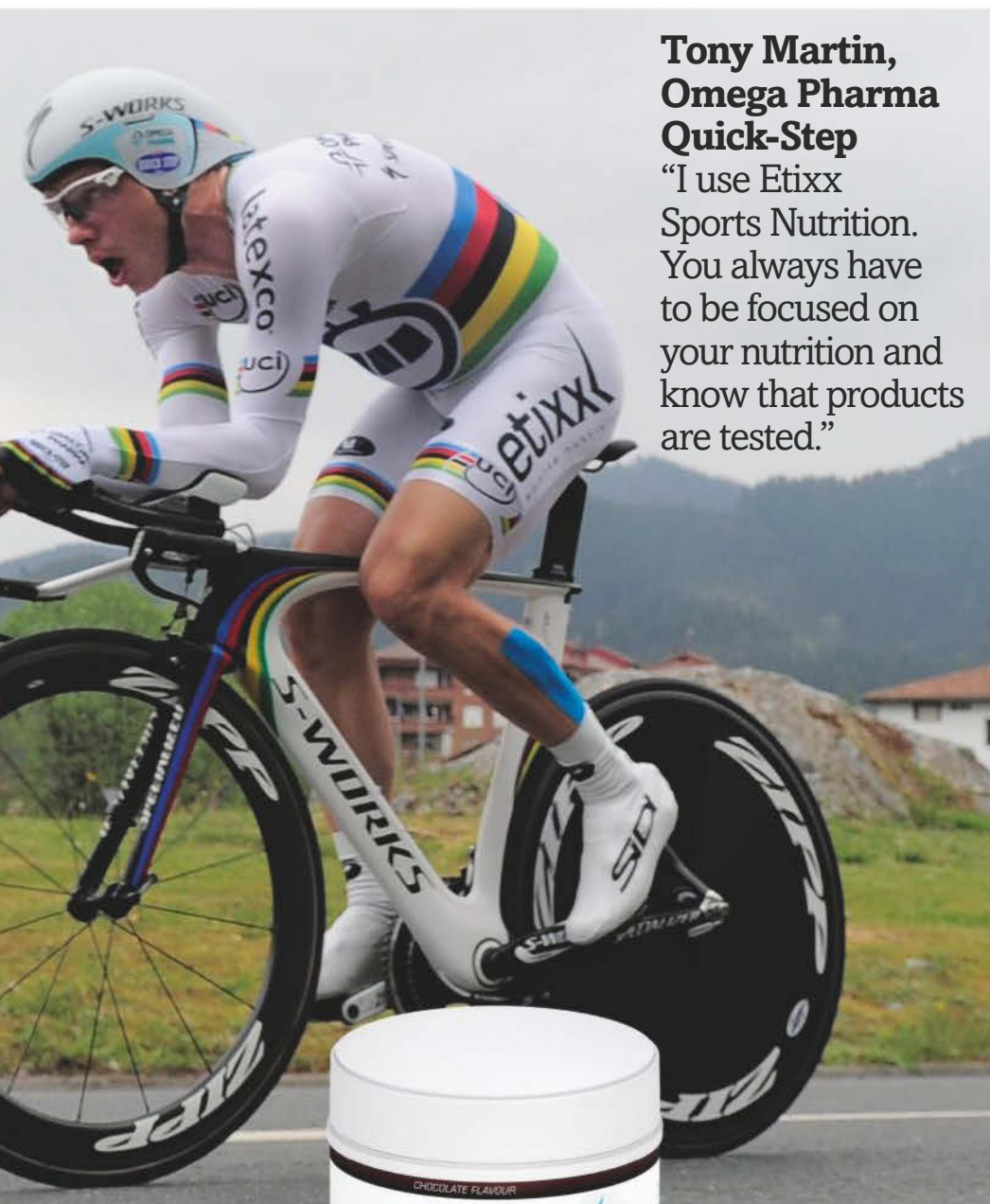
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EAT FAT RIDE LONGER

It is no secret that cyclists love carbohydrate-rich foods. As soon as winter comes, the idea of doing a ride without a cake stop is almost inconceivable, but is a high-fat diet actually better for increasing your endurance? *Dr Graeme Stewart PhD* explains all.

The mere thought of a long ride is ample excuse to “carb load” on pasta or pizza. For many years, this high-carbohydrate diet was reported to be healthy and recommended for everyone, not just athletes. High-fat diets, on the other hand, were

lambasted as the major cause of coronary heart disease. In recent years, however, the tide of medical opinion has started to turn against the high-carbohydrate diet. It was realised that not only were some of the assumptions about fat causing heart disease wrong but in reality it is carbohydrate that was the key factor in the development of heart disease.

For years, elite endurance coaches have understood the importance of fat in the diet. Four-time Ironman world champion, Chrissie Wellington's coach famously used to turn up at her door with wheels of cheese and chocolate with strict instructions for it to be gone by race day. With more and more elite athletes moving towards low-carbohydrate, high-fat diets, carbohydrate cycling and fat-adaptation protocols, is it time to ask if our relationship with the carb-rich foods we love so much is optimal for performance? What are the potential benefits of low-carbohydrate, high-fat (LCHF) diets, and what are the pitfalls?

There are two ways LCHF diets can benefit the cyclist, which I will deal with in turn. Firstly, by modifying the ratios of carbohydrate and fat we burn during exercise to spare glycogen and increase endurance. Secondly, by manipulating our energy status to enhance training adaptations. Finally, I will offer some practical advice on how these ideas might be incorporated into training for someone new to the idea.

LCHF DIETS TO BOOST FAT BURNING AND ENDURANCE

So, what is the problem you might ask? Cycling burns a lot of carbohydrate, I eat a lot of carbohydrate; it's the perfect relationship. The problem is that our bodies do what we tell them to do. If we tell them to run they adapt to running, if we tell them to cycle they adapt to cycling and if we feed them carbohydrate they adapt to carbohydrate.

The issue with carbohydrates is that our bodies can only store a limited amount of them in the form of glycogen. The amount of stored glycogen can vary dramatically but for most male athletes is 1,600kcal to 2,500kcal. Anything we consume after our glycogen stores are full is efficiently converted to fat for storage, a fact most of us are all too aware of. This small amount of glycogen is only enough to sustain intense exercise for a maximum duration of 60 to 90 minutes, which even if you're fast is only a 25-mile time trial or a half marathon.

For endurance athletes training for sportives and triathlons, this leaves a considerable deficit. Bonking, hitting the wall, and blowing are terms that refer to that point when we no longer have enough glycogen to maintain the intensity we are going at.



TRAIN EARLY

Training in a carbohydrate-depleted state, before breakfast for example, primes our muscles to respond to training.

To get past this point, we need to find more energy and ration the glycogen we do have, so we need to eat food while on the bike but also burn other fuel in the form of body fat. While at rest or during low-intensity exercise, we burn mostly fat; as the intensity increases we burn more and more carbohydrate, until at race pace most athletes burn exclusively carbohydrate. Top competitors, however, have trained their bodies to be less reliant on carbohydrate and burn more fat at higher intensities through a combination of exercise and diet.

The secret to training our bodies to burn more fat and at higher intensities is

“BE SMART ABOUT WHAT YOU EAT AND YOU CAN GET THE BENEFITS OF LOW CARB TRAINING WITHOUT SACRIFICING PERFORMANCE”

to understand how exquisitely responsive they are to what we eat and do. If we eat fat we will become better at metabolising fat by upregulating the genes required for fat transportation and metabolism. If we remove carbohydrate or limit its availability during exercise, it forces the body to turn on fat-burning systems and activate specific signalling pathways that affect training and fuel usage. Equally, if we eat a very low-fat high-carb diet we can switch off our fat metabolism and become better at using carbohydrate.

So, if you want to be able to burn more fat at a higher intensity and spare your precious glycogen, then you need to be doing two

things. Firstly, there is no short cut: you need to be training a lot, but also, secondly, eating plenty of fat in your diet, meaning LCHF eating could be for you. By definition, LCHF typically means that you get as much as 60 per cent of your daily calories from fat. This level of consumption is surprisingly challenging, but in reality simply eating a higher proportion of fat in your diet will begin to have an effect. The most difficult part of making your diet high fat is not the inclusion of high fat foods such as cheese but avoiding high carbohydrate options such as bread. Carbohydrate-rich foods are palatable and energy-rich, so even just using that second slice of bread to make your cheese sandwich can take it from being high fat to high carbohydrate. The most common reason for an LCHF diet to fail to give results is a failure to control overall calories. Simply adding cheese to every meal is not enough; a determined effort needs to be made to reduce carbohydrate intake to a surprisingly low level.

How often should you have LCHF meals and for how long? Researchers have experimented with many different combinations of training and LCHF diets over the years. Studies looking at athletes on high-fat diets over short periods of around five days before a test have found that this is enough to increase fat metabolism and glycogen sparing. The down side to this short-term approach is that it can result in a negative effect on test performance. The reason for this is likely due to glycogen depletion when the body has not fully had a chance to adapt to fat as a fuel source, along with an increase in perceived exertion.

Longer, more extreme approaches involve LCHF diets for many weeks or months, during which time the body can

fully adapt to using fat as a fuel source and performance is not negatively affected. There are changes in the production of enzymes required to move and burn fat as well as spare glycogen. In the 18th century, polar explorers would fuel their trekking by eating the animals they took with them. On this ultra-low-carb diet, they would report weakness and an inability to perform at high intensity, but after a number of weeks this feeling passed, no doubt as their bodies began to adapt to using fat as a fuel source.

In the shortest studies, however, it has been shown that after just a single high-fat meal, fat burning will increase and oxygen consumption decrease even if your glycogen status is good. This indicates that we can use LCHF even in moderation and if we do it regularly it could have a positive effect. While research is far from conclusive as to whether adapting to fat can benefit performance, it is likely that during longer training, as well as sportives, Ironman triathlons and other ultra-distance events, being able to burn fat is key to going the distance. This is especially true if you find it hard to take carbohydrate during events, as running out of glycogen is a key limiting factor. Remember, if you are on an LCHF diet there is no benefit in turning up glycogen depleted. Research suggests the biggest benefits to LCHF adaption occur after a period of glycogen restoration so always switch back to carbohydrate in the week before a big race to top up your glycogen stores.

MANIPULATING YOUR CARBOHYDRATE LEVELS TO ENHANCE TRAINING ADAPTATIONS

So, if LCHF diets can have a negative effect on day to day performance why would you put yourself through it? Training with low glycogen or low carbohydrate supplies, especially at high intensity, is difficult to impossible. Physical performance goes down, relative to a fully carbohydrate-fuelled state, and conversely perceived exertion goes up.

What scientists are starting to explain, and what athletes have known for a long time, is how energy status interacts with training. Elite athletes frequently train in a glycogen-depleted state, either by training multiple times in a day

PROs and CONs of LCHF

PRO	CON
Increased short term FAT burning	Reduced short term performance if glycogen depleted
Increased short term glycogen sparing	Increase in perceived exertion
Long term adaptation to increased FAT burning and reduced CHO burning	Reduced effectiveness of high intensity sessions.
Enhanced aerobic training adaptations	Increased blood lipids
Improved body composition	Unpalatable food choices
Improved insulin sensitivity	Difficult to control overall energy intake

or by restricting carbohydrate intake.

What we know is how this can increase the effect of training because fuel status and physical exercise use the same pathways to communicate in muscle cells. By activating these signalling pathways in two complementary ways simultaneously, we can increase the activation of genes required for aerobic training adaptations and improved fat transport and utilisation.

Essentially, training in a carbohydrate-depleted state, especially in the presence of fat such as when on a high-fat diet, primes our muscles to respond to training. So even if performance is negatively affected in the

also frequently train twice per day. The first session initiates glycogen depletion and primes muscle cells such that during the second training session, although performance may be poor and perceived exertion high, the training stimulus is amplified.

HOW TO USE LCHF IN THE REAL WORLD

Scientists have a habit of making questions black or white in order to simplify them enough to study and understand. Unfortunately, it can make results very hard to translate into reality and explain why apparent positive results observed outside the lab are hard to demonstrate scientifically. The observations of elite athletes only doing some workouts in a low-carbohydrate state points us towards how we can incorporate LCHF meals into our day-to-day training.

You wouldn't do the same training every day, so why would you eat the same diet every day? Train your metabolism in the same way you train your muscles. In training you may use high intensity and low intensity and sometimes go in between, right? Well, you do the same with your diet by

eating LCHF some days but eating normally or high-carbohydrate on other days. In this way it is possible to get the fat-burning and glycogen-sparing benefits of the LCHF diet as well as the performance benefits of a high-carbohydrate intake. Tailor your diet to your training to get the most out of both, either in terms of aerobic training adaptations or performance.

Start by including one or two LCHF days per week in your training, starting 12-16 weeks before your target event. Ideally, this will be when you are doing longer, steady training or training more than once in a day, and you should not focus on performance but expect it to feel harder.

On other days, eat normally or if you have a high-intensity interval session planned, make sure you take on enough carbohydrate to fuel it or you may find it impossible to complete.

As you get closer to your target race, start doing more sessions where you practise your race fuelling strategy and focus more on performance. However, if you are training for long endurance events be sure to maintain good levels of fat in your diet right till the end to ensure you maintain the fat-burning potential you spent so long developing.

Dr Graeme Stewart PhD is a UKCC Level 3 triathlon coach and Triathlon Scotland Performance Coach of the Year 2014. He is an elite Ironman competitor and brand ambassador for OSMO nutrition.

TRAINING ON A LCHF DIET CAN BE TOUGH, ESPECIALLY AT HIGH INTENSITIES. SHORT-TERM PERFORMANCE WILL SUFFER BUT IF YOUR TRAINING ADAPTATIONS ARE INCREASED THEN IT IS WORTH IT ON RACE DAY

short term, in the longer term our training adaptations can be increased.

An observational study of sub-2hr 15min elite marathon runners found that during preparation they would do as much as 20 per cent of their general training sessions in a low-carbohydrate state. As their target race got closer they did more sessions with high-carbohydrate levels and practised race fuelling, focusing more on performance. -Elite cyclists

TRY THIS...

Adding avocados or olive oil is a good way of introducing more healthy fat into your diet





MEAL SUGGESTIONS

64

 calories
16 grms
of carbs

243

 calories
27 grms
of fat

84

 calories
21 grms
of protein

BREAKFAST:

CHEESY SCRAMBLED EGGS

2 eggs — scrambled (176kcal)
1 slice brown wholemeal bread (88kcal)
1 tbsp butter (102kcal)
5 grams cheddar cheese (20kcal)
1 handful of spinach (7kcal)

Melt half the butter in a hot frying pan and scramble two free-range organic eggs. Meanwhile toast one slice of wholemeal bread. When the bottom of the frying pan begins to clear add the spinach and wilt briefly, turning the heat off almost immediately. When you have turned the heat off add a large pinch of grated cheddar and serve on the toast. Season with pepper.

393

 Total
calories

72

 calories
18 grms
of carbs

252

 calories
28 grms
of fat

64

 calories
16 grms
of protein

LUNCH:

AVOCADO AND STREAKY BACON TOAST WITH POACHED EGG

1 slice brown wholemeal bread (88kcal)
1 tbsp butter (102kcal)
25 grams grilled streaky bacon (77kcal)
1 egg (poached) (70kcal)
1/4 avocado (54kcal)

Grill or fry the bacon until crisp while heating a pan of salted water to just below simmering point. Crack a free range organic egg in to the hot water and poach for 2-5min so white is firm but yolk is still liquid. Toast bread and butter, rub with garlic to add flavour if desired. Top the toast with sliced avocado, grilled bacon and finish with the poached egg.

391

 Total
calories

148

 calories
37 grms
of carbs

324

 calories
36 grms
of fat

156

 calories
39 grms
of protein

DINNER:

RIBEYE STEAK SANDWICH

100 grams beef — ribeye steak (345kcal)
1 wholemeal pitta bread (143kcal)
25 grams coleslaw (17kcal)
25 grams cheddar cheese (101kcal)
50 grams iceberg lettuce (16kcal)
1 Roma plum tomato (24kcal)
10 grams tomato chutney (17kcal)

495

 Total
calories

Season the steak with salt and pepper, rub with light olive oil and pan fry for 2-3min on each side. Let the steak rest and toast the pitta bread. Slice the steak and place on the opened pitta, topping with lettuce, tomato slaw and chutney.

BOOZE AND BIKE RIDING

Most of us are well aware of the negative consequences of alcohol and yet the post-race ritual will often involve a drink or two, either in celebration or perhaps in commiseration. *Dan Henchy* of PBscience explores the relationship between alcohol and cycling in greater depth...



ALCOHOL CONSUMPTION is a popular and sometimes problematic part of society and equally the relationship

between booze and cycling is a complicated and sometimes contradictory one. Aside from the celebratory champagne on the podium, more recent headlines have focused on the post-race binges of Sir Bradley Wiggins and the more sordid claims from Jonathan Tieman-Locke that a massive bender a few days out from the Worlds was behind his adverse biological passport. For more romantic stories we can look back to the early years of the Tour de France, when loyal domestiques would raid bars along the route to supply their team leader with beer, wine and champagne to quench his thirst. Apparently, the great Jacques Anquetil was particularly partial to a glass of bubbly.

Aside from the pros, amateur athletes also add to the story of alcohol and cycling. I'm sure most cyclists have enjoyed, or at least experienced, the early morning spin to clear the head after one too many, and often a glass of wine or beer is a reward for completing a hard training ride. However, the negative effects of alcohol have never been more in the public eye. Concepts such as 'Sober for October' and the raft of people giving up the booze as a New Year's resolution is a tip of the hat to the negative effects of alcohol but also a recognition of the fact that for many it's not an easy thing to quit! What follows is a little more information on the effect alcohol has on the body so you can decide where a drink fits in with your own cycling.

DRINKING WHILE CYCLING

I'm sure alcohol isn't top of your list of performance-enhancing drinks but anyone who witnessed Adam Hansen taking a beer from a fan on Alpe d'Huez's Dutch Corner, or anyone who's enjoyed a nice cold beer or cider on a hot summer's ride might wonder about the effects of alcohol consumed while cycling. Dehydration is a commonly cited reason for avoiding alcohol but research suggests that this is only a problem if you consume a drink stronger than four per cent ABV. Stick to relatively weak or moderate strength beverages and the fluid consumed more than offsets the minimal diuretic effect.

The big concern when it comes to alcohol and cycling is the effect it has on coordination, reaction times and decision making. For the same reason drink driving is banned, it is also an offence to be in charge of a bicycle in a public place while unfit through drink or drugs. This is

a separate offence to that for drink driving so you won't be subjected to a breathalyser or blood test but if a police officer judges that you are drunk then you could be arrested and face a fine of up to £2,500.

In summary, one or two drinks on a social ride with an alcohol content lower than four per cent ABV won't adversely affect your performance but cycling home from the pub after a skinful is dangerous and illegal.

DRINKING THE NIGHT BEFORE CYCLING

While drinking on the bike or during a ride is probably not that common and certainly not something that most would consider for a race or big challenge ride, it is more likely that you'll be faced with the situation of trying to ride the morning after the night before. Again, if the event is your big cycling goal of the year then it's hard to think of a reason why you would want to risk underperforming for the sake of a few drinks but faced with the prospect of drinking the night before a big ride, what are the likely effects?

Dehydration: the evidence that alcoholic drinks of less than four per cent ABV do not have a net dehydrating effect is equally relevant to the night before your ride as it is during the ride itself. If you must drink stronger drinks than this, and if you're partial to a nice Belgian Tripel or a glass of red wine then you're certain to fall foul of this, so be sure to alternate alcoholic drinks with soft drinks. You should also make sure to end the night with a soft drink to avoid going to sleep in a dehydrated state.

Fuelling: alcohol goes straight to the front of the queue when it comes to metabolism so it will be burned in preference to fat and carbohydrate as the two more common energy sources. In particular, with carbohydrate metabolism impaired by alcohol, you may find that high intensity exercise performance is reduced more than if you stick to steady endurance riding.

Sleep: one of the big downsides of consuming alcohol the night before an important ride is the effect it has on your sleep. While many swear by a nightcap to help send them off to sleep, there is a large body of evidence to suggest that alcohol consumption before bed reduces the amount of time you spend in the REM phase of the sleep cycle. So while you may get the same quantity of sleep, it is the quality that's lacking. If you've ever found yourself struggling to keep your eyes open after a night on the sauce, even if you've still had your regular hours of sleep, then you've experienced this first hand.

Of course, the other problem with having a drink is that it often goes hand in hand with a late night and a subsequent reduction in sleep hours ➤



to give a double whammy with the lack of quality sleep.

And finally, no summary of drinking the night before a ride would be complete without mentioning the dreaded hangover. Alcohol is a toxin and so the headache and sickness that often follows what for some might only be a few drinks is a combination of dehydration and mild alcohol poisoning. Or maybe not so mild if you really overdo things!

DRINKING AFTER YOUR RIDE

Many cyclists are well aware of the negative consequences of consuming alcohol before and during a ride but a post-ride celebratory drink is no problem, surely? Using booze as a 'reward' is perhaps the most common use of alcohol among athletes, so what are the effects of post-exercise alcohol consumption? Again, dehydration and impaired sleep are the same as previously discussed — quality sleep is vital to the recovery process so already we can see that post-exercise alcohol consumption will negatively affect the recovery process. Beyond that there are a number of other considerations:

Hormonal: a large alcohol intake (1.5g alcohol/kg of body weight, equivalent to ~12 standard drinks for a 70kg cyclist) has been shown

to decrease free testosterone. Even worse, if this 'binge' takes place after endurance exercise the effects are both more pronounced and more prolonged. Large alcohol consumption has also been shown to increase the levels of cortisol and decrease levels of growth hormone. You don't necessarily have to understand the physiology, other than to know that these effects are opposite to that desired for recovery and adaptation following training. The research does not show such pronounced effects for more moderate alcohol consumption but the combination of prolonged endurance training and post-exercise alcohol consumption still combines to give a much worse effect.

Glycogen replenishment: in the past, it was believed that alcohol had a negative effect on glycogen replenishment but recent studies have shown that provided there is an adequate intake of carbohydrate post ride, then alcohol does not have an impact on this crucial area of recovery for endurance athletes. In other words post-ride alcohol consumption only hinders the replenishment of your vital carb stores if you replace your carbs with alcohol. Be sure to consume your recovery shake and meal, even if you have an alcoholic drink alongside your post-ride meal.

It's worth pointing out that beer is not a source of carbs despite the urban myth to the contrary. Any carbohydrate that goes into the brewing of beer is turned into alcohol by the fermenting process. Unfortunately beer is not a viable recovery drink for replacing carbohydrate!

Muscle protein synthesis:

perhaps linked to the altering of the body's post-exercise hormonal balance, large alcohol consumption after training has been shown to reduce muscle protein synthesis in the time following training. Training breaks down muscle and provides a stimulus to adapt and improve. If we then impair the process of rebuilding and repairing the damage done then we undo all the benefits of that hard work!

Immune system: most people are familiar with anti-inflammatory drugs such as ibuprofen and therefore view inflammation in the body as a negative. Perhaps fewer people recognise that inflammation is a vital biological process that plays a key role in the function of the immune system. Research has consistently shown that acute (short-term) alcohol consumption upsets the balance of normal inflammatory processes and reduces the effectiveness of the immune system. After a hard training session, the immune system is already in a very weakened state and it is quite clear that post-exercise alcohol consumption only makes this worse. If you're someone who regularly suffers with illness and infection after hard training sessions (or indeed hard drinking sessions), then this information should encourage you not to mix the two.

NOT ALL BAD...

You'd be forgiven at this point for thinking that the conclusion of this article would be a summary that cyclists should never touch alcohol for all of the negative points listed above. In the interests of balance, however, there are a few positives.

Alcohol increases the release of dopamine, a hormone and neurotransmitter that acts on the

brain's pleasure centre. As such it helps give that feelgood factor and can help you to relax after a strenuous ride or competition

Most of the effects discussed here are the short-term effects of alcohol but moderate consumption over the long term has been suggested as beneficial in insulin sensitivity.



ALCOHOL AND BODY WEIGHT

If everything we've mentioned in the previous sections hasn't got alarm bells ringing, we still haven't touched on one of the biggest fears that people have with consuming alcohol — weight gain. The problems here are manifestations of many of the things discussed previously but here they are again in the context of weight gain.

Burning it off: alcohol is burned in preference to carbohydrate, fat and protein; in other words, when you consume alcohol it literally goes straight to the top of the food chain and any other energy substrates you consume won't be metabolised until alcohol is. When you consider that alcohol is converted to acetate, which is toxic to the body, maybe you'll be more forgiving that your body chooses to get rid of it first. What it does mean though, is that fat and carbohydrate in your diet are more likely to be stored as body fat while the alcohol is metabolised. So alcohol almost never gets stored as fat directly, but it does increase the chance of other nutrients ending up as the infamous beer belly.

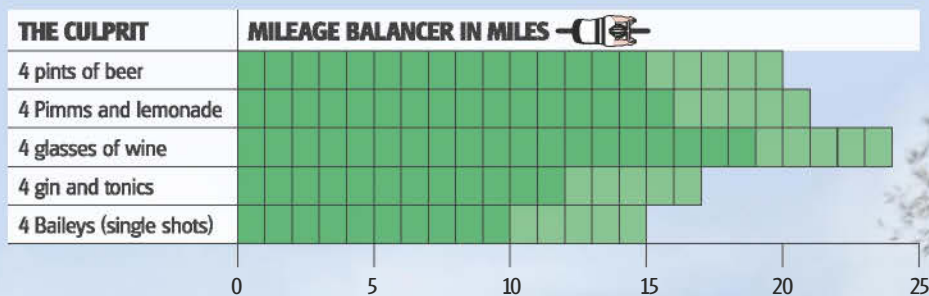
Poor food choice: as if hormonal imbalances, metabolic disruption, ruined sleep and poor recovery weren't enough, another problem associated with alcohol consumption is the increased chance of making poor choices with your diet. It might begin as something as innocent as a packet of crisps or pork scratchings but it ends with the post-pub doner kebab. Increased body weight or poor body composition can be just as commonly an indirect result of alcohol consumption rather than the direct biological effects. A little discipline goes a long way here, but try to eat before you go out, or arranging to meet friends at a restaurant with healthy food choices rather than at a bar can go some way to helping you maintain some discipline.

So if you're striving to get the most out of your cycling, it has to be said that limiting alcohol consumption in your lifestyle is an important step in maximising the effect of your training. If you're partial to the odd drink, or if you often find alcohol consumption negatively affects your riding, then the trick lies in moderation. One or two small drinks is going to have minimal effect on your performance, provided you remember to rehydrate and don't miss out on quality sleep as a result.

Timing is also an issue: looking at hard training as a punishment for a binge, or conversely treating a few drinks as a reward for a tough session is the wrong way to look at things. To get the best of both worlds try and separate a night out from your key training sessions. By understanding the effects of alcohol on cycling you can make informed decisions either way. Cheers!

PEDAL POWER

So, how many more miles might you need to pedal to offset your Christmas party calories?



Winter warmers

If you need a little extra motivation to get on the bike during winter, when it's cold, dark and most likely wet outside, the thought of some good food waiting for you when you get back in should help. We've compiled some healthy, hearty winter warmer recipes to keep you going all the way to spring

ROAST SHALLOTS WITH PENNONI RIGATI, CHARGRILLED BUTTERNUT SQUASH AND PUMPKIN SEEDS

● Serves four ● Preparation: 25 minutes ● Cooking: 20 minutes

1 small butternut squash
Olive oil
20 small round shallots
300g pennoni rigati or penne pasta
50g pumpkin seeds
1 chilli
6 tbsp water
Knob of butter
1 sprig of rosemary, chopped
Parmesan cheese
Rocket, for dressing

1 Peel and cut the squash into one inch cubes or similar sized pieces. Season the squash with salt and pepper. Drizzle over a little olive oil then sauté for five minutes in a non-stick, hot pan until coloured on the outside.

2 Peel the shallots and add to the squash in the non-stick pan. When they are both cooked, remove from the pan and set aside on a plate lined with kitchen paper.

3 Cook the pasta in a large pan of boiling salted water. When cooked, drain.

4 Toast the pumpkin seeds in the oven at 180°C for five minutes.

5 Add a quarter of the cooked squash with the chilli and the water to the same pan as the shallots were in, and cook a little bit more until it almost starts to break down. Add a knob of butter as this will form the sauce. Add the chopped rosemary, mix and then add the cooked squash and the shallots. Then mix in the hot cooked pasta.

6 Check the seasoning and serve in hot bowls. Grate or shave over the parmesan. Finish with fresh rocket leaves and a little olive oil.

Quick and easy and full of flavour, this is a great dish to power you through your winter ride

509
Calories

Each serving contains

SUGAR	FAT	SAT FAT	SALT
13.8g	16.2g	3.9g	0.2g
15%	23%	20%	3%

% GDA (guideline daily amount)



A super healthy breakfast that still tastes like a delicious treat. Adjust the ratio of milk to water to suit your taste

294
Calories

PINK LADY PORRIDGE WITH PECANS AND CINNAMON

● Serves four ● Preparation: five minutes ● Cooking: five minutes

150g porridge oats
400ml semi-skimmed milk
300ml water
½ tsp cinnamon
2 Pink Lady apples, cored and diced
2 tbsp soft brown sugar, or to taste
2 tbsp pecans, roughly chopped

1 Place the oats, milk, water and cinnamon in a heavy based saucepan. Bring up to a gentle simmer, stirring frequently, and cook for five minutes or until thick and creamy. Add a splash more milk or water if it is getting too thick.

2 Stir through the diced Pink Lady apple, cooking for just another 30 seconds or so to warm the apple through.

3 Spoon into bowls, sprinkle brown sugar to taste and scatter on the pecans. Serve immediately while piping hot.

Each serving contains

SUGAR	FAT	SAT FAT	SALT
20.7g	10g	2.1g	0.1g
23%	14%	10%	2%

% GDA (guideline daily amount)

The infused beetroot in this dish makes for a lively and flavour-packed lunch. The sweet potato will keep you going right through the afternoon

446
Calories

BAKED SWEET POTATO WITH JUNIPER AND BLACK PEPPER BEETROOT, HAM AND A SOUR CREAM, CHIVE AND MUSTARD DRESSING

● Serves four ● Preparation: 10 minutes ● Cooking: 45 minutes

For the sweet potato:
4 large sweet potatoes
2 x 150g juniper and black pepper beetroot, cut into wedges
180g shredded ham hock

For the dressing:
170ml tub sour cream
A small bunch of chives, snipped
1-2 tsp English mustard, to taste
Salt and freshly ground black pepper

1 Preheat the oven to 200/180/gas 6. Scrub the potatoes well and prick a couple of times with a fork. Arrange on a baking tray and bake for about 40 minutes, until soft all the way through when pierced with a sharp knife.

2 Whilst the potatoes are cooking, make the dressing by mixing together the sour cream and chives in a bowl. Season to taste with mustard, salt and freshly ground black pepper.

3 When the potatoes are cooked, cut down the middle and open up a little. Divide the beetroot between the potatoes and scatter over the ham. Finally, drizzle over the dressing before serving immediately.

Each serving contains

SUGAR	FAT	SAT FAT	SALT
24.5g	11.9g	6.4g	1.9g
27%	17%	32%	32%

% GDA (guideline daily amount)

ONE PAN ROAST LUNCH WITH SESAME LEMON CHICKEN, TENDERSTEM AND BUTTERNUT SQUASH, SERVED WITH STEAMED RICE

● Serves 4 ● Preparation: 10 minutes ● Cooking: 50 minutes

8 chicken thighs
1kg butternut squash, peeled & cut into 3cm chunks
1 bulb garlic, broken into cloves, unpeeled
2 tbsp olive or rapeseed oil
2 lemons cut into quarters
240g Tenderstem
2 tbsp runny honey
2 tbsp sesame seeds

411
Calories

- 1 Preheat the oven to 180°C.
- 2 Lay the chicken in a large roasting tin and scatter the butternut squash and garlic cloves around it. Drizzle over the oil and squeeze the juice from the lemon quarters, tucking the empty shells in and around the chicken and butternut squash.
- 3 Roast in the oven for 40 minutes, until the chicken is crisp and the squash is soft and lightly caramelised. If your chicken thighs are particularly large you may need to increase cooking by 10 minutes.
- 4 Blanch the Tenderstem in boiling water for two minutes, drain and set aside.
- 5 Remove the tray from the oven, stir through the blanched Tenderstem, coating it well in the lemony juices. Drizzle the honey all over and sprinkle on the sesame seeds.
- 6 Return to the oven for a further 10 minutes until the chicken is sticky and golden. Serve immediately with plenty of rice and perhaps a little soy sauce.

A super easy and relaxed dish that has a bit of everything for everyone - great for entertaining with family and friends and easily doubled up to serve more.

Each serving contains

SUGAR	FAT	SAT FAT	SALT
18g	17g	3.5g	0.4g
20%	24%	175%	7%

% GDA (guideline daily amount)





HOW DO YOU MEASURE UP?



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TECHNIQUE

Slippy fallen leaves under wheel, strong winds and rain mean that being skilful on the bike is of even greater importance during the winter than it is in the summer. Heading away from the roads into the woods for some cyclo-cross or mountain biking makes a lot of sense. It will help develop confidence in your bike-handling skills as you test yourself on different types of terrain. Mistakes won't have such high consequences — after all, skidding and sliding around in the mud is all part of the fun.

IN THIS SECTION...

P92 TURBO YOURSELF FITTER

Five tough and challenging indoor workouts — time to start bashing out some intervals



P96 HOME WORKOUTS FOR CORE

Forget the gym — you don't have to leave the house to do a full-body workout



PLUS...

P100 TRAIN FOR CYCLO-CROSS

Skills and technique for off-road success

P102 BE YOUR OWN THERAPIST

Calf-strengthening exercises to protect your Achilles

Don't worry about losing your fitness at this time of year, says *Robert Hicks* — these turbo trainer sessions will maintain your form and have you flying come spring

TURBO YOURSELF FIT THIS WINTER

5 Killer sessions



00:22
TOTAL RIDING TIME**IMPROVE
POWER**

This session doesn't mess around. It's designed to hurt your legs and burn your muscles. If you want to become a more powerful rider, improving your kick and turn of pace, there is no easy way to do so. You are going to have to climb inside the hurt locker.

10min effort.....Zone 2
15sec effort.....Zone 5
45sec recovery.....Zone 2
30sec effort.....Zone 6
30sec recovery.....Zone 2
45sec effort.....Zone 4
15sec recovery.....Zone 2
1min effort.....Zone 5
1min recovery.....Zone 2
45sec effort.....Zone 4
15sec recovery.....Zone 2
30sec effort.....Zone 6
30sec recovery.....Zone 2
15sec effort.....Zone 5
5min recovery.....Zone 2

02:30
TOTAL RIDING TIME**BOOST
ENDURANCE**

We can see your eyebrows rising here! Two hours 30 minutes, are you mad, *Cycling Fitness*? No, we're not! Remember what we just said: the turbo-trainer should be a part of your cycling routine. And if you can't get out for an afternoon ride, this is the next best thing.

For the first hour, the pace should be comfortable, but the intensity should increase slightly as the efforts shorten. After each effort, give yourself five minutes of steady spinning in a low gear to recover. If you are really struggling to maintain concentration for such a long time you can shorten or lengthen the efforts.

55min effort.....Zone 2
40min effort.....Zone 3a
25min effort.....Zone 3b
10min effort.....Zone 4

00:27
TOTAL RIDING TIME**IMPROVE
TECHNIQUE
AND LEG
STRENGTH**

One-legged intervals are a great way to improve technique and leg strength. While it may seem odd, clipping in with one foot and spinning away, there are significant gains to be had. Technique is something that many amateur cyclists struggle with, and can be easily forgotten over the winter. It needs to be worked on.

Peddalling with just one leg will improve cycling efficiency, helping to build strength and use more leg muscles, which undoubtedly will make you a far stronger cyclist.

10min effort.....Zone 2
2min effort.....Zone 3b
right leg only
1min effort.....Zone 3
both legs
2min effort.....Zone 3b
left leg only
1min effort.....Zone 3
both legs
2min effort.....Zone 3b
right leg only
1min effort.....Zone 3
both legs
2min effort.....Zone 3b
left leg only
1min effort.....Zone 3
both legs
5min recovery.....Zone 2

00:48
TOTAL RIDING TIME**IMPROVE
LACTATE
THRESHOLD**

Any session that works on improving your lactate threshold is going to hurt. Though working on such a specific, high-end area of performance may not be totally necessary during winter, it won't do any harm chucking in one of these sessions every now and then.

Research has shown that shorter, sharper, intense sessions can improve aerobic endurance. Improving lactate threshold is very important for those who race; it improves climbing and even time trialling performance.

These sessions are short, require a lot of effort and will tire the body, so be prepared.

10min effort.....Zone 1
5min effort.....Zone 4
1min effort.....Zone 2
5min effort.....Zone 4
1min effort.....Zone 2
5min effort.....Zone 1
2min effort.....Zone 5
30sec.....Zone 2
2min effort.....Zone 5
30sec.....Zone 2
5min effort.....Zone 1
1min effort.....Zone 6
30sec.....Zone 2
1min effort.....Zone 6
30sec.....Zone 2
1min effort.....Zone 6
30sec.....Zone 2
5min recovery.....Zone 1

00:25
TOTAL RIDING TIME**INCREASE
LEG SPEED**

Being able to pedal quickly and efficiently is a core cycling skill. You'll be able to ride quicker while putting less strain through your legs, and you'll expend less energy.

In some situations, a slower cadence has its advantages. If you're on the wheel of a rider, you may find it easier to conserve your energy, to 'roll' in a lower gear. But if you're out on your own, pedalling quicker in a smaller gear will serve you far better.

But it's not about spinning as fast as you can. It's important to pedal correctly and efficiently, and avoid bouncing in your saddle as your legs spin. You'll bounce if your pedalling action isn't smooth enough — as you 'stomp', your body bounces. Try and focus on a smooth action, and power through the downstroke before bringing your foot smoothly round for the upstroke to repeat the process.

This session is perfect for the turbo-trainer, as you might not be used to pedalling at such high speed, so doing so out on the road may be challenging.

This session won't make you aerobically fitter, but it will allow you to ride at a faster rate while conserving more energy.

10min.....Zone 1
5min.....Zone 2
30sec.....Zone 6
(Make sure you're in a gear with very little resistance. Try and measure your cadence. It should be around the 130rpm mark. This is a big effort, but as you're in an easy gear, it shouldn't be impossible.)
30sec.....Zone 2
Repeat five times
5min.....Zone 1

Every cyclist has a breaking point, and it usually comes in around mid-January when the rain hasn't stopped falling for over a month, the wind is refusing to abate and the snow and sleet are only just beginning to make an appearance.

The good news is that all bad things eventually come to an end. But it's not going to stop any time soon, and unfortunately it only takes a week or so for your fitness to start tailing off.

It leaves all of us in a bit of a predicament. We can wrap up, fill our bottles with hot chocolate, throw caution to the wind and brave the elements, or we could settle down on the sofa with a brew, in front of *Deal or No Deal*.

But before you resort to Noel, there is another option — though it's probably not what you want to hear: the turbo-trainer.

Whether you like it or not, the turbo is a great bit of kit to maintain and even improve your fitness. OK, it's not the most entertaining thing on the planet, but it has never claimed to be. The turbo never wanted to be popular or make you laugh. Its job is to get those legs turning, fast!

It's about time we embraced the turbo-trainer instead of mocking it; it's about time we accepted it for what it is instead of hiding from the truth; it's about time we started using the turbo-trainer effectively.

LEARN TO LOVE IT

Turbo-training doesn't have to be a chore or a necessity in the quest to find fitness. Change your way of thinking. See turbo-training as another element in the cycling process, another factor in the cyclist's training plans, another brick in the wall in order to

GETTING IN THE ZONE

ZONE	EFFORT	YOU CAN
1	Easy	Speak, sing and even dance
2	Slow	Chat away
3a	Steady	Hold a conversation, just
3b	Brisk	Speak in intermittent sentences
4	Threshold	Manage short sentences
5	Hard	Say the odd word
6	Very hard	Barely breathe!

become a fitter and faster bike rider. Learn to love your turbo-trainer and your turbo-trainer... well, no, it doesn't quite work like that, but you know what we mean. Start using the turbo properly, in a committed fashion, and it won't be long before you start reaping the benefits.

We've devised five simple yet effective turbo-training sessions designed to test, maintain and improve your cycling fitness. It's not rocket science, nor is it anything fancy. Just five good old sessions for you to try — so give them a go!

HOUSE WORK *OUT*

Getting your body strong and conditioned this winter needn't require a gym membership. *Robert Hicks* shows you how you can achieve success in the comfort of your own home. It just takes a little know-how

The off-season is a time when you can put the bike away and allow yourself to work on aspects of your physical fitness and strength that tend to get neglected. One of the areas that all cyclists should work on — but too often neglect — is their core.

A lot of cyclists will spurn any form of exercise that threatens to add weight or bulk to their frames. It makes sense. The power-to-weight ratio is such a vital component of cycling performance, and any 'unnecessary' weight gain would only serve to slow you down. After all, you wouldn't call the likes of Chris Froome, Alberto Contador and Vincenzo Nibali beefcakes, would you?

And you know what, we agree with you. We don't want you to start bulking up. When we talk about improving your core, we mean strengthening and conditioning it. There is a significant difference between strengthening muscles and building bulk.

And while we may not call the likes of Froome, Contador and Nibali body-builders, all of them work on their muscles, ensuring they are strong enough to withstand the pressures being placed on them. If they didn't, they would soon fall prey to injuries, some of which you are no doubt familiar with.

WEAK CORE WORRIES

First of all, it's probably a good idea to clear up what is meant by the core. Many people believe it's just the muscles that sit in and around the torso such as the abdominals, and internal and external obliques. But it's not. Many sport doctors now like to refer to it as your core system or core functions, as there are many other muscles that are involved, which all have an impact on your performance.

A lot of muscles are interconnected and if there are any imbalances, issues will occur as other muscles try to compensate, which could have a domino effect on your body, bike position and performance.

For example, a weak set of low

back muscles (a problem a lot of cyclists have) will have a negative impact on your stability and your lumbar/pelvic position (seated riding position). Stability is so important when riding; a body that is unable to keep still on the bike may result in excessive side-to-side movement, also known as rocking, causing tension in your back and an unstable platform for your legs and hips from which to produce power.

In the majority of these cases, the hamstring, quadriceps and gluteal muscles, which are the muscles we use most when pedalling, may have to start working twice as hard in order to keep you steady, which will inhibit power and performance.

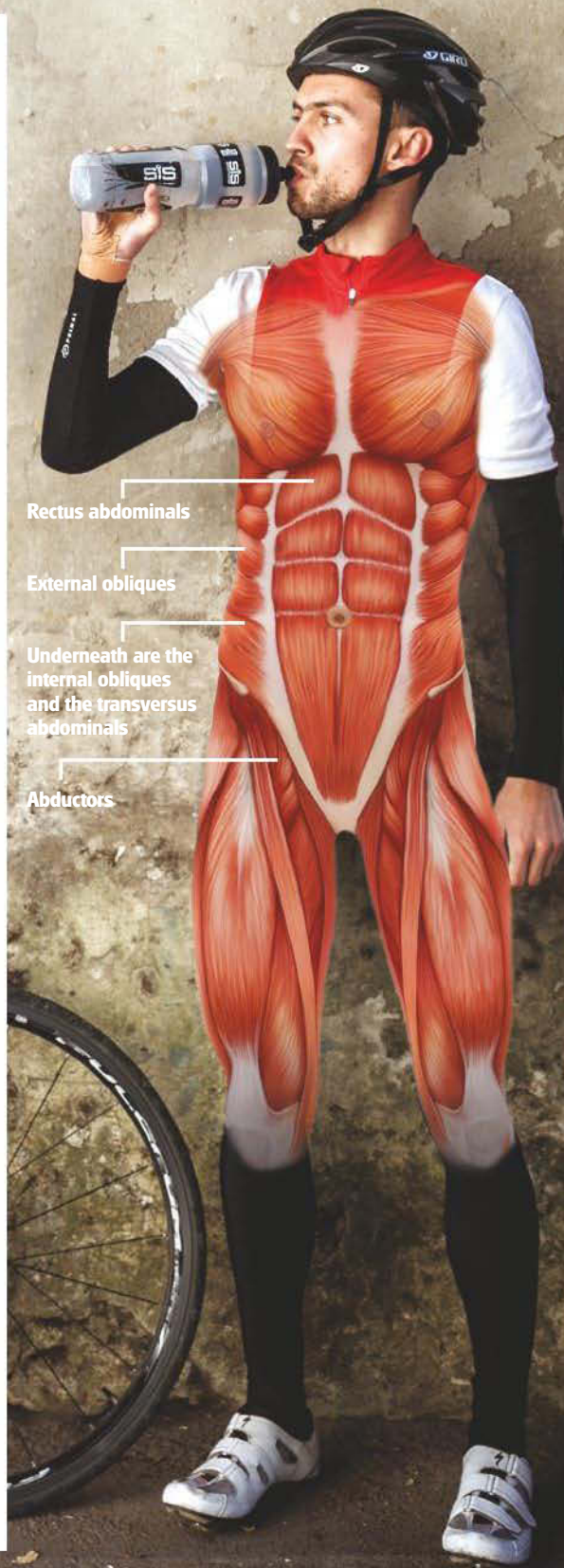
Overuse of these muscles (especially if they aren't used to such work) may result in tears and tightness, which could cause flexibility issues. You may even exacerbate lower back pain; one of the main causes of lower back pain is insufficiently conditioned hamstring muscles.

Again, if the muscles of the upper back aren't conditioned for spending so many hours on the bike, tension and stiffness can build, potentially creating tightness in and around the neck, which would affect your ability to move as freely as you would like, as well as increasing the risk of pulled muscles and trapped nerves.

These are just a few problems that may occur when riding if your muscles aren't conditioned. There are many more. Muscles are interconnected and if there is any sort of muscular imbalance, other muscles will jump in and try to help. Muscles are good friends to have but they have their limits, and once they can no longer help, they will give up, and that's when pain and injury can creep in.

The good news is that the majority of these issues can be avoided. Yes, lower back pain doesn't have to be an occupational hazard of long endurance rides! You are allowed to ride pain-free.

It just takes a little know-how, a bit of application and some dedication and you can limit the risk of injury and discomfort and improve your performance.



10 EXERCISES TO DO IN OR AROUND YOUR HOME

Gym memberships, although they do have their good points, can be a pain in the backside. What with signing-on fees and long, tied-in membership plans, they can become rather expensive — even more so if you happen to get injured or simply can't be bothered to go.

That's why we have devised these 10 exercises that you can work on in the comfort of your own home. They are just as effective as the exercises you would do at the gym, only without the distraction of over-exuberant personal trainers, or scantily clad, stick-thin, pretty 21-year-olds who make you feel totally inadequate.



01 PUSH UP

Stand in front of the table, with your arms bent and your hands placed on the edge. Make sure your hands aren't too hinged, as placing too much body weight on them could cause discomfort.



LOOK TO IMPROVE

Chest, shoulder and core strength



02 WEIGHTED LUNGE

Stand with your feet together, hold a weight to add resistance.

LOOK TO IMPROVE
Quadriceps and glutes



03 WEIGHTED SQUATS

Stand upright with your feet slightly wider than shoulder width apart.



Keeping your head upright and your back straight, slowly bend your knees until your thighs are parallel to the floor. Hold position for a few seconds, squeezing in your core, before slowly pushing upwards back to your starting position. Do not bend further than 90°!



04 TRICEP DIP

It's important to use a stable chair or sofa arm for this exercise. With your back to the chair, place your palms on the edge of the seat and your legs straight out in front of you. Start with your arms straight to take your weight, and then bend slowly at the elbows, dropping your bottom towards the floor.

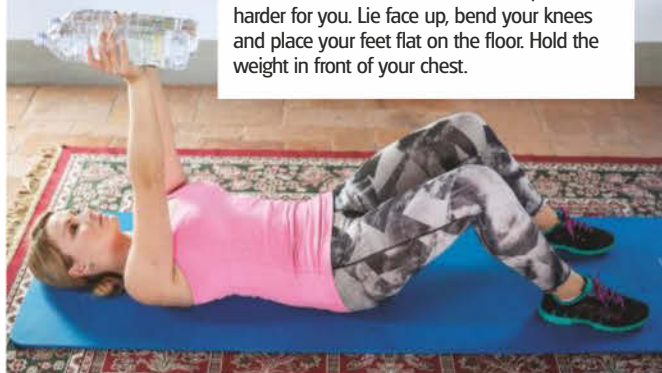


Dip until your upper arms are parallel to the floor, pause, and then push back up to the starting position. The tricep dip is a great exercise to build upper body strength, which will help improve stability and posture.



05 WEIGHTED SIT-UPS

Sit-ups are a great exercise to improve core stability and strengthen your abdominals. However, after a short while, the body will get better at this exercise and a normal sit-up won't be working the body hard enough. Using extra resistance can make basic sit-ups work harder for you. Lie face up, bend your knees and place your feet flat on the floor. Hold the weight in front of your chest.

A

Slowly curl up from the floor, lifting one section of your spine at a time. Hold at the top position before gently reversing the curl to lay your back down on the floor.

LOOK TO IMPROVE
Abdominals and core stability

B**06 SEATED ROW**

Using the resistance of an inner tube or an exercise band, this exercise will stimulate a seated row in a gym. Hook your inner tube or exercise band around a chair or table leg. Sit with your legs out in front of you and with a slight bend in your knees.

A

Activate your core to keep you stable, and pull the band towards you. Pull the band until your arms are into your chest and slightly lean back. Release and let the band stretch out your arms until you feel a slight stretch, then repeat.

LOOK TO IMPROVE
Upper back, rear of shoulders, biceps



LOOK TO IMPROVE
Abdominals and core stability

**07 THE PLANK**

Start on your knees and place your hands on the floor in front of you, fingers pointing straight ahead. Your arms should be straight, with your elbows directly underneath the shoulder and your chin slightly tucked in. Engage your abdominals and lengthen your spine, extend through the top of the head as you lean forwards. With your hips lifted, keep your legs together and extend straight back with toes curled under so some weight is on the balls of the feet. Without over-tightening, activate your legs, especially the hamstrings. Activate your core. Your body should be in a straight line from the ears, through the shoulders and hips to the heels. Take slow breaths in and out — hold for three to five breaths.

08 THE BRIDGE

This exercise is very simple, but very effective and will engage and gently strengthen the large gluteal muscles and hamstrings. The bridge will also loosen and lengthen the psoas muscle — located on the side of the lumbar region of the spine — a key muscle used in cycling. As you lift, you will also engage your abdominals, and by encouraging strength in the glutes, will help work on some of the major stabilisers of the lower back and pelvis when riding. Start by lying flat on the floor, with knees raised and hands by your sides.



Engage your glutes and lift your bum off the floor until abdomen and thighs are in a straight line. Hold for two seconds and then lower down, returning to a starting position.

LOOK TO IMPROVE
Glutes, hamstrings, core



09 BACK EXTENSIONS

Performing this exercise will strengthen the back extensor muscles that are used to maintain the cycling position and which help support you when spending lengthy spells on the bike. It's very important these muscles are conditioned to be able to withstand such pressure. Start flat on your stomach, arms reached out in front of you keeping your chin gently tucked in. You should be looking at the floor a couple of inches in front of you. Pull your elbows and forearms back into your side, raising them off the ground.



You should start to feel your shoulder blades engaging. Keep these muscles contracted hard throughout the exercise and hold the position for 30 seconds. You can expand on this exercise: at the same time as extending your back off the floor, press your knees and feet firmly together, bend the knee until your feet are just off the ground. Hold for 30 seconds.

LOOK TO IMPROVE
Back extensor muscles



10 STAND TALL AND REACH STRETCH

This exercise may look simple, but it's highly effective, decompressing tension in the spine, which will help you to maintain symmetry when you ride. Such a deep stretch will also help activate your core muscles, specifically your internal and external obliques — the muscles that run down the sides of your torso. Start with your knees and feet almost together with your arms straight up overhead. Reach with both hands as high as you can. Engage your core muscles and take slow, deep breaths. From this position, gently alternate stretching the left arm upwards for a second and then the right.

LOOK TO IMPROVE
Core muscles, upper, mid and low back





Training to be a... **CYCLO-CROSS RIDER**

Cyclo-cross is growing in popularity, with weekly league races and long-distance adventure cross events now widely available. *Louise Mahé* explains the basic skills you need to take part

With more and more events springing up around the country, cyclo-cross is the perfect winter event to partake in. Not only does it hone your bike handling, it also keeps fitness levels high when it's too wet or icy to get out on the roads. Whether you're planning on giving your local league race a go or riding an adventure cross event, you'll need basic skills and fitness to be a cross rider.

ENDURANCE Base endurance is a must for cross racing. Though races are typically 40-60min long, you'll be riding at a high intensity for an extended period. Having good base fitness will help on longer cross rides. Riding off road takes longer than riding the same distance on road; a 100km off-road event is far more challenging.

MIND Cyclo-cross rides and races often take on routes with multiple line choices. Choosing the right line can often be the difference between sailing through a technical section with ease and hitting a root at the wrong angle and sliding out. Before taking part in a cross race, it's a good idea to do a few practice laps to test different line options and give yourself some confidence before the race. Try out various lines during practice; find the alternatives that could help when the field bottlenecks at a technical section.

Be aware that during a race the course can change significantly. Think for yourself and don't just follow the rider ahead or stick rigidly to the same line. Read the terrain and what's happening around you; an area that was rideable in practice may end up too muddy and rutted to ride through. Where you can, aim for grassy areas, which will offer grip. With experience, your handling will improve.

POWER Cyclo-cross courses have boggy, muddy sections and even sand pits that require a short burst of high-end power to get through. Some cross races feature short, steep banks that you must power over. Being able to put the power down for short bursts to despatch these sections is vital when racing cross or during off-road training. The ability to recovery quickly from these powerful bursts is really important when racing, so getting used to this level of output — i.e. maximal — is crucial. Be aware, this is not about leg speed alone — it's a powerful push that requires a high amount of leg strength.



RUNNING Running is an integral part of cyclo-cross. Whether it's to get over hurdles, up a steep climb or across a section of the course that's unrideably muddy, being able to run fast is important. Anyone taking cross seriously should incorporate running in their training, including speed work for those uphill sprints and fast hurdle sections. Getting used to using these muscles effectively takes time, so ease into it with some gentle jogs.

It's also essential to learn to carry your bike properly. Over short distances, for

hurdles, lifting the bike by the top tube is OK. For a longer run, or if you're going uphill, shouldering the bike is best. This enables you to get into your stride and use the other arm for momentum.

Once you've dismounted, using the hand on the side nearer the bike, grab the down tube about halfway along and lift it in one movement so the top tube sits in the groove between your neck and shoulder. Once it's on, hook your arm through the frame and loop it under the down tube so you are able to hold on to the drop of the bars.



UPPER BODY Riding cross uses your upper body in a variety of ways, so working your arms and core off the bike will be very helpful. When manoeuvring your bike through muddy conditions and technical sections, changing your body position to distribute your weight differently is essential. Dip your inside shoulder when cornering, as this helps lower your centre of gravity, and transfers weight more effectively through the tyres.

Through bumpy or loose sections, it is vital to keep relaxed and allow the bike to move under you. However, your core still needs to be engaged and strong to maintain control. Likewise, putting the power down on steep banks or over muddy sections demands a strong core. Keep still so all the power goes through your legs and it will power you through the demanding section smoothly and efficiently.

HANDS In cross, hand position has to vary massively, so flexibility to move depending on the conditions and terrain is important. When descending, having your hands on the tops keeps you stable as you dismount. However, this isn't always possible, especially if you need to brake before dismounting. Just like when you ride on the road, when descending (or on fast, technical sections) it's best to be on the drops, covering the brakes, with greater manoeuvrability. When riding off road, it's usually a good idea to keep the brakes covered, so you're prepared to adjust your speed at any time to cope with obstacles.

EYES Cross courses have many twists and turns, so looking well ahead to where you're going is really important. Focus on the terrain ahead to allow you more time to prepare and choose your line — if you're looking just ahead at the front wheel, you won't have time to react properly. A key thing to remember, especially in technical sections, is to look at where you want to go, not at the things you want to avoid. It may seem obvious, but if you look at something, you're likely to drift towards it.

DISMOUNT AND REMOUNT Being able to get off your bike quickly, to run up or over the obstacles in your path, is a skill that takes lots of practice. Similarly, remounting needs to be done quickly and efficiently to save time and get back on as soon as possible.

To dismount smoothly, it's best to hold the tops of the bars, for stability. However, if you need to brake and slow down beforehand, you may find yourself holding the hoods. Learning to master both types of dismount is important to cater for all conditions.

As you come to the point where you wish to

dismount, undip and swing your lead leg over the back wheel. Bring this foot down and, as you plant it on the ground, unclip the opposite foot — in a single motion — and break immediately into your stride. You're running!

Remounting is literally a leap of faith. A small sprint helps get back up to speed before remounting. Running alongside the bike, holding on to the bars — again, it's best to hold on the tops for stability — make a two-legged jump on to the bike. To avoid painful mishaps, aim to land inner-thigh-first on the saddle before sliding properly into position.



Calf strengthening

The Achilles may be the strongest tendon in the human body, but it's far from immune to painful injuries and if damaged, can take a long time to heal. These do-at-home exercises focus on conditioning the calf and Achilles

Achilles and calf injuries aren't as prevalent as knee and back issues, but that's not to say that they can't cause serious complications, and if left untreated could turn into quite significant injuries. While cycling won't necessarily cause such injuries, it can certainly exacerbate any problems.

The Achilles tendon is a long band of tissue that runs down the back of your calf and connects to your heel bone. It's the thickest and strongest tendon in the body, and is able to withstand at least 10 times the body weight of an individual. The job of the Achilles tendon is simple: to help raise your heel as you walk and also assist in pushing up the toes and lifting the rear of the heel.

However, complications can arise if the tendon becomes damaged, and unfortunately, it can take a long time to repair unless rehabilitated properly.

SPOTTING THE SIGNS

The most common symptom of an Achilles

tendon rupture is a painful snap at the back of the heel. This hurts, and trust us, you will know if it ruptures. Fortunately, it is very rare for this injury to occur while cycling, as there usually isn't enough force put through the Achilles to cause such impact.

However, it is possible to bruise and damage an Achilles through cycling, mainly through over exertion, which can weaken it leaving it more susceptible to tears.

You may also experience pain in the tendon if your pedalling technique isn't quite right, often a result from 'ankling' — where the toe points upwards at the top of the stroke and downwards at the bottom.

Discomfort may also arise by having your cleats too far forwards, which may encourage you to pedal with your toes, and cause you to put too much stress through your tendons.

Another cause of Achilles tendon injuries could be from overuse of the calves, which can occur during long bouts of cycling, continuously riding big gears, or through lots of climbing.

CYCLE TO STRENGTHEN

Cycling can strengthen the Achilles tendon by helping to build surrounding muscles to support the tissue. Cycling also helps develop efficient calf muscles, which will help limit the risk of such injuries.

However, if you have a pre-existing Achilles injury, or it's perhaps inflamed from a heavy bout of cycling or another sporting activity, then cycling can significantly exacerbate the condition.

Appropriate clothing can be worn to help minimise such injuries, most notably, wearing well-fitting shoes that are set up correctly. Having the correct saddle height will also reduce the chances of damaging the tendon, as it will limit the amount of stress you place through your lower leg when you pedal.

However, the best way to avoid these injuries is to condition your Achilles and your calf muscles so they have the required amount of flexibility, mobility and strength.

This can be achieved through a number of exercises.

CALF STRETCHES

A simple set of calf stretches will help reduce the pull and tension on the Achilles tendon. When performing calf stretches it's important to work on both major calf muscles as they can be over-tightened, affecting the function of the tendon.

GASTROCNEMIUS

1 They don't come any simpler than the push against the wall stretch. However, it's mighty effective. Start by leaning forwards against the wall, with the **leg you want to stretch straightened. The front leg should be bent.** It's important that you keep your rear heel (straight leg) on the floor, slightly turned out.

2 To deepen the stretch, lean further into the wall. You should feel a stretch in the calf muscle.



SOLEUS

1 Although this may look similar to the first exercise, there are some slight differences, which will help deepen the stretch of the second calf muscles. Again, lean forwards against the wall with the leg you want to stretch out behind you. Unlike the first stretch, **both legs should be bent.** Keep your rear heel on the floor, slightly turned out.

2 Lean into the wall and push your weight into your heels. To deepen the stretch, flex your rear knee until you feel the stretch in the lower part of your leg.



ACHILLES ISOMETRIC EXERCISES

This exercise is good for building strength in the calf muscles and resilience in your Achilles tendon. By using your own body weight you will reduce the risk of overloading the tendon, and therefore reduce the risk of causing injury or discomfort. Performing this exercise will engage the gastrocnemius (superficial contraction phase) and soleus (deep muscle phase) muscles, as well as create manageable pressure on your Achilles tendon.

SUPERFICIAL

1 Start flat-footed before slowly raising up onto your tiptoes, going as high as you can go.

2 Slowly lower half the way back down and hold this position for 30 seconds — with your legs **straight**.



DEEP MUSCLE

1 Start flat-footed before slowly raising up onto your tiptoes, going as high as you can go.

2 Slowly lower half the way back down and hold this position for 30 seconds — with your knees **slightly bent**.



CALF AND ACHILLES TOWEL STRETCH

This exercise will help engage a deeper stretch, as well as provide resistance to build strength and conditioning in your calf muscles and Achilles tendon. Products such as the TheraBand work very well, as they are flexible enough and can withstand a fair amount of force. However, if you don't have one, a towel will suffice.

1 Sit on the floor with both of your knees extended.

2 Make a loop with the band and securely attach one end of the loop over the leg you want to work on.

3 Pull the band or towel slowly towards you; it should pull your toes up and slightly back, and you'll feel a deep stretch in your calf muscles. You will also feel your Achilles stretch. Hold this position for 15-20 seconds.



Place the band at different angles to help increase mobility and strength around the Achilles and ankle, as well as the calf muscles

STRENGTHEN THE OUTER ANKLE MUSCLES

1 Sit on floor with both knees extended.

2 Make a loop with the band and place the exercising foot inside the loop.

3 Push your ankle outward against the resistance of the band.



STRENGTHEN THE INNER ANKLE MUSCLES

1 Sit on the floor with both knees extended.

2 Make a loop with the band and place the exercising foot inside the loop.

3 Pull your ankle inward against the resistance band.

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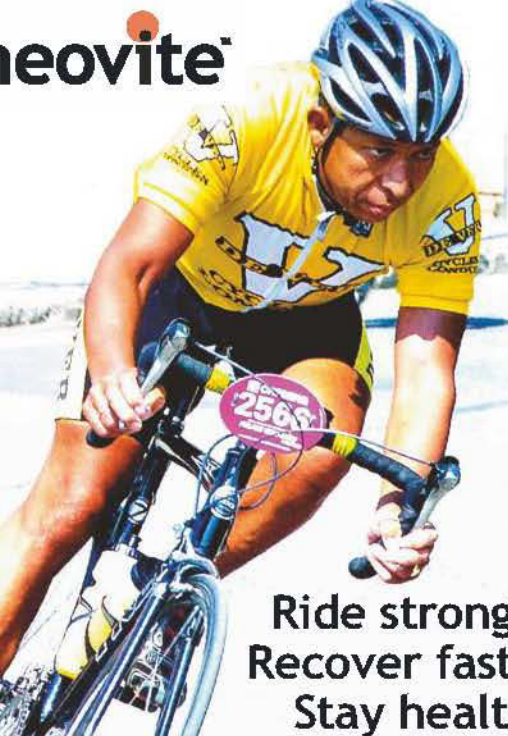
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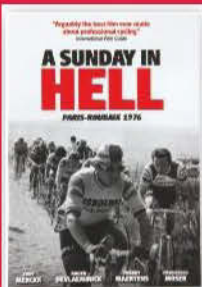
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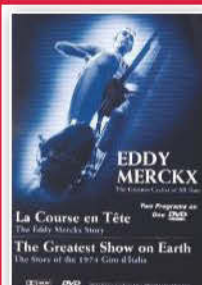
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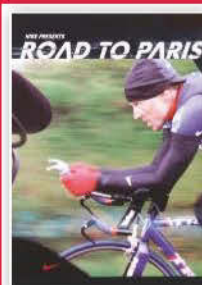
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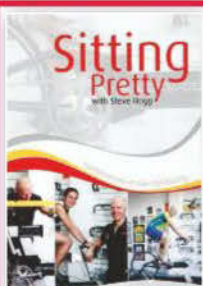
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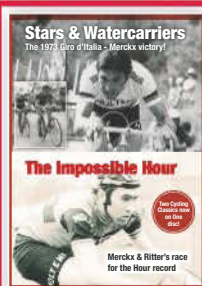
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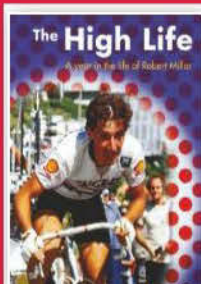
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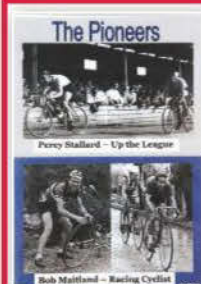
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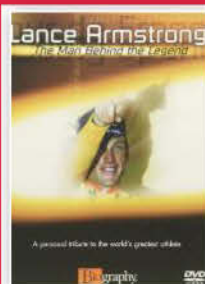
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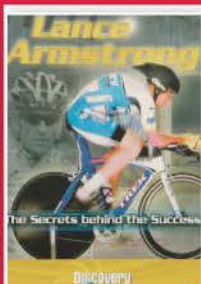
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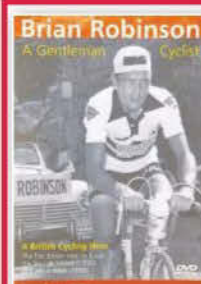
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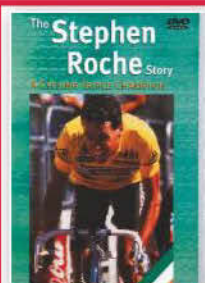
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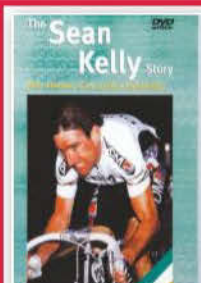
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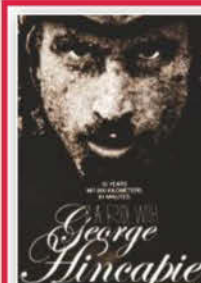


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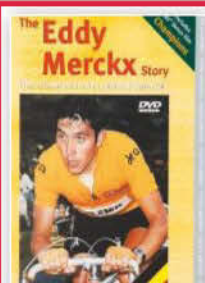
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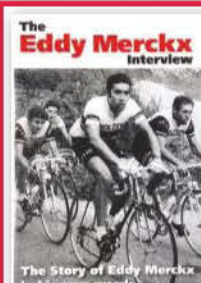
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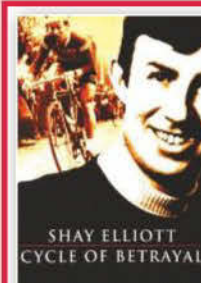
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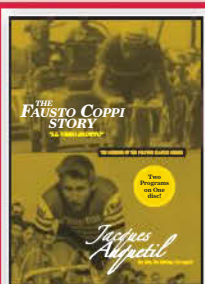
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What Wiggins can teach us

Sir Bradley Wiggins ticked one of the few empty boxes remaining on his CV when he won the World Championship time trial in Ponferrada, Spain this year. He's won world and Olympic titles on the track, he's the reigning Olympic road time trial champion, and he's won the Tour de France. But the 2014 time trial was his first world road title.

Wiggins only has to win a Classic and set the World Hour record, both of which at 34 years of age he is planning to attempt, and he will have one of the most impressive victory records in men's cycling. His latest triumph also underlines something that many cyclists believe: Bradley Wiggins can win anything he puts his mind to.

Wiggins's core ability is that of a time triallist and it's something he can stretch from very short to quite long distances, and apply to lots of situations. I remember following him during a training session for an article I wrote in sister magazine *Cycling Weekly* way back in 2006. I was driven by his father-in-law, Dave Cockram, who had been a good racer in his day, and he said something about Wiggins that has stuck with me ever since.

"No matter how fast he has to spin his legs, they can do it," he said. "On the track, in races like the Madison, whatever gaps open, whenever he needs those extra revs, they are there, and they get him the lap or close a gap just when he needs to."

Wiggins can dose his effort to whatever is needed at any moment in nearly any cycling challenge. He can stretch his speed from taking a lap on a bunch of track racers doing 55kph, through the four minutes of a pursuit, to a one-hour time trial or mountain climb at the pace needed to keep the yellow jersey. It's an innate ability, a harmony of mind and body. His time trials are always judged to perfection. He never starts too fast, never fades; not when he's 100 per cent on it. And he was on it in Ponferrada.

While you're unlikely to share the raw talent of Sir Bradley you can learn from the specialised way he prepares for such feats. So how can you adapt and use his methods in your training programme?

Chris Sidwells
looks at how Sir Bradley Wiggins's training for the 2014 World Championship time trial could help improve your cycling fitness



WEIGHT GAIN

After becoming the first British cyclist to win the Tour de France, Wiggins put on weight. It was partly intended, partly natural. Climbing ability is the key to winning a Grand Tour and success in the Alps and Pyrenees is pure mathematics: it's the product of the power a rider can maintain for 40 to 60 minutes — endurance power — divided by body weight.

Wiggins was already a lean athlete, but he lost eight kilograms to win the Tour and a lot of that was muscle. But even though he won the 2012 Tour's two time trials, and the Olympic title in the same year, Wiggins felt his time trial power had been slightly compromised.

Time trial performance, like climbing ability, can also be expressed mathematically: it's endurance power output divided by aerodynamic drag. Weight doesn't come into it so much, unless it increases drag, and putting an extra eight kilograms on Wiggins's 2012 skeletal frame didn't.

So when Wiggins came to looking at his objectives — winning the world time trial title and targeting Paris-Roubaix in the spring — he decided to boost the power side of the equation by gaining muscle.

WHAT YOU CAN DO

Stop worrying about weight loss and focus on increasing your power output. This means less dieting and more training. Even taking into account your power-to-weight ratio, the lifeblood of a good climber, increasing power has a larger effect in the equation than reducing weight.

Work on increasing your power with short, hard rides, and in particular short, hard interval training. This kind of training gives you the biggest fitness return when it comes to increasing your steady-state speed, climbing ability and cycling efficiency.

LIFTING WEIGHTS

Yes, even Tour de France winners hit the gym. Wiggins uses weights as part of his core strength regime. A strong core provides the solid platform that your legs push down against so all of your leg power goes into the pedals. If your core isn't solid some of your leg power is lost in lifting up your body.

All pros have strong cores, but the best time trialists have the strongest. The finest time trialists keep their upper bodies absolutely still when they are riding, which requires super core strength to avoid compromising the power their legs put into the pedals. Maintaining an aerodynamic position also taxes core endurance.

Wiggins's core strength regime includes weights, as well as the type of exercises you see advised in core training articles and books. "I do hardly any upper-body work," Wiggins said, "I do core work and single-leg presses, but not in the way most do weights with 10 reps. I do 50 reps on each leg but I only push 10 kilograms on each rep. That targets the glutes, but it's done specifically to build endurance in them."

WHAT YOU CAN DO

Start doing some core exercises then try some light weight training. You don't need a gym, but it might be worth trying an introductory session, because you can discuss your needs with a qualified instructor and get shown how to do the chosen exercises properly.

After that it's worth buying a couple of dumbbells or kettlebells and working out at home. Exercises that simulate pedalling, like alternate steps-ups or single-leg squats, should be done, plus exercises that overload the muscles you use when cycling. The gluteal muscles are very important in cycling, and deep squats really get them firing.

Keep the weights light and go for overload by doing lots of repetitions. You aren't after pure strength, but strength you can maintain. Keep in mind something Chris Boardman told me once: "A 12-year-old could probably push out 400 watts on a bike for a few seconds; the trick is to push out 400 watts for an hour."

TRACK TRAINING

Wiggins put in a big block of track training this summer in the run up to the Commonwealth Games team pursuit, where he and the rest of the England team took a silver medal. He talked about its effect shortly before the time trial at Ponferrada. "Track training pushes your form because of the extremes you go to," he said.

Track riders do lots of race-speed efforts — for them that's at world record pace most of the time — so they knock out really big power numbers. But they take long rests in between each effort.

Team pursuiter might do something like 4 x 1,000 metres at race speed, but with 20 minutes at least between each of the 1,000-metre efforts. They will come off the track, pedal on rollers to cool down, relax, refuel, get back on the rollers then back on the track for another full-on effort.

That is overload training for a time triallist; it conditions the body to perform well over what will be required in the event. Riding fixed gear on the track at race speed also requires total concentration and perfect pedalling, so it boosts the neuro-muscular pathways that make for efficient pedalling.

WHAT YOU CAN DO

Include some high-intensity interval training (HIIT) in your regime. Something like seven x 30 seconds, with 90 seconds recovery between each one, bookended with a warm-up and an easy pedalling cool down. These intervals are best done on a turbo-trainer.

Training like this boosts your power output, has a positive effect on your maximum steady-state pace and improves your cycling efficiency, so you'll burn less fuel for any given effort. It's also great training if you are squeezed for time, because you can easily fit the above session into 30 minutes, with 10 minutes to warm up and five minutes to cool down.

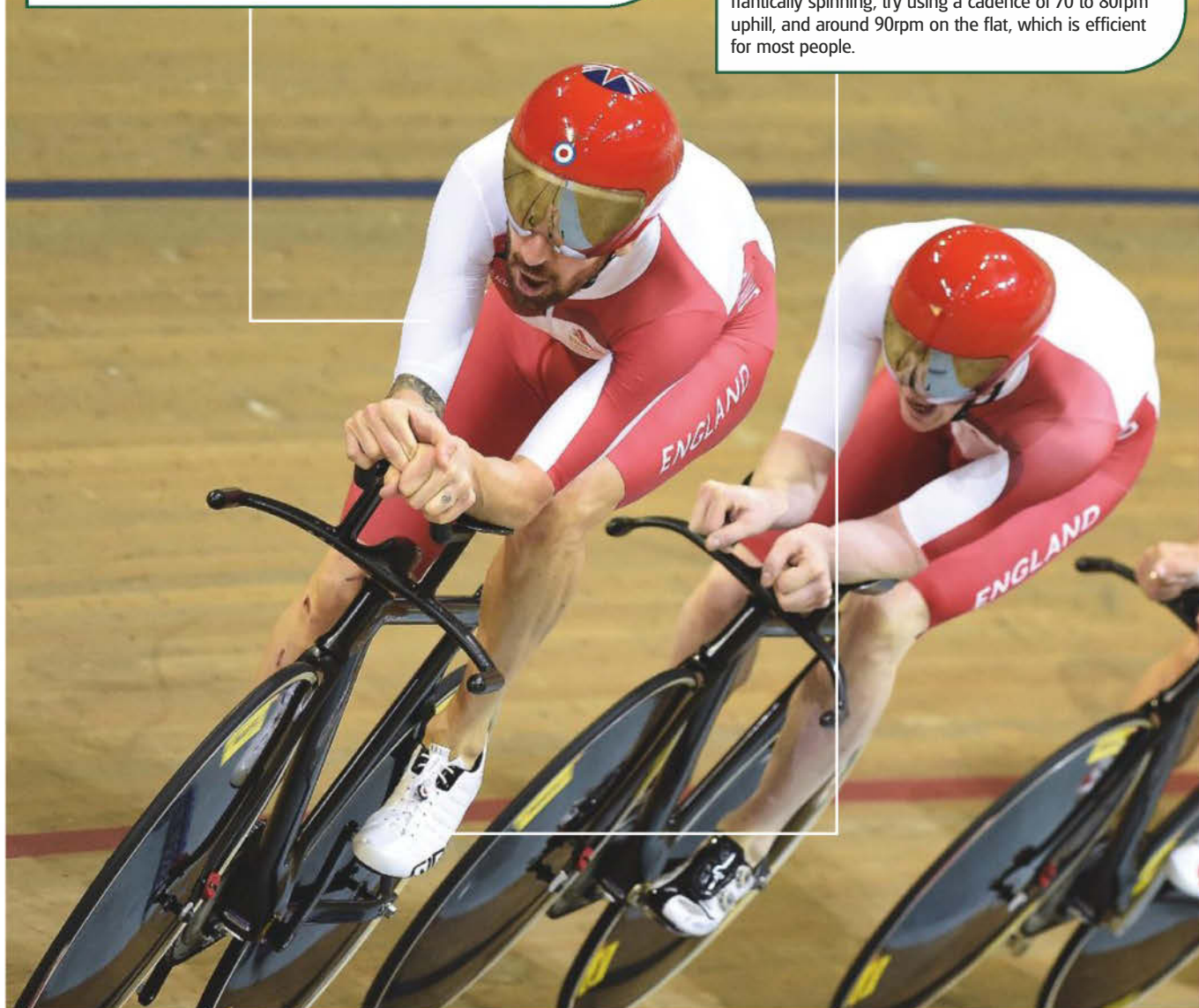
DROPPING CADENCE

On the track high cadence is important for success, and this is an approach Wiggins took from his days in the velodrome to road time trials. But after being beaten to gold by Tony Martin in the 2013 World Championship time trial Wiggins said: "I averaged 456 watts for 55 minutes but I didn't feel I got the return for that level of effort."

So this year he dropped the cadence he uses in time trials. "I've focused on getting more distance per pedal stroke," Wiggins said. He also used a massive 58-tooth chainring when he won the Worlds in Ponferrada this year.

WHAT YOU CAN DO

The changes Wiggins made are quite technical and only really pertain to world-class time trialling. However, you can try increasing your gear and lowering your cadence on hills — you'll find it easier to do this by altering the angle of your foot to help push the pedal around as much of each pedal stroke as possible. Instead of frantically spinning, try using a cadence of 70 to 80rpm uphill, and around 90rpm on the flat, which is efficient for most people.



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HOW TO USE THEM

Making the most of your time means working at the right effort level for you. Here's how to work out where your training zones are

If you scan through any of the sessions in our three training plans you'll notice that the different parts of the ride are described using numbered training zones. Simply work at that level of effort for the time given.

How hard is 'Hard'?

If you're training entirely on feel, you can follow the basic effort and feeling descriptions below, but these are a bit vague, which is why we've linked them to a series of percentage zones based on either maximum heart rate or functional threshold. All you do is decide which approach works best for you, work out your zones and start training.

Working from feel

Columns two and three of the 'Training zones' table outline how each of our different training zones should feel and how much talking you'll be able to do at that intensity. Working from feel is a lot less precise than using heart rate or power, but it will work at a pinch until you can get a more objective measure.

Max Heart Rate training zones

Heart rate is a measure of the strain your body is under and

how hard it is working — the higher the heart rate, the greater the strain. If you have a heart-rate monitor, you can create a set of personal training zones based on your maximum heart rate (MHR).

You can use the following formulae to predict your MHR without so much as getting out of bed:

MEN: $214 - (0.8 \times \text{age})$
WOMEN: $209 - (0.9 \times \text{age})$

For a more exact number, perform the following simple (but not easy!) test:

- 1 Ride Easy for 15-30 minutes, finishing up at the bottom of a long, steady hill.**
- 2 Ride up the hill for five minutes at a nice, Brisk pace, then coast back to the bottom.**
- 3 Climb the hill again. Start at the same Brisk pace, but this time increase your effort every 30 seconds. When you reach the point where you can push no harder, stand on the pedals and sprint until you simply have to stop.**
- 4 Coast back to the bottom and repeat step three again before riding home.**

You'll probably hit your MHR somewhere towards the middle of the third ascent. (You will need a heart-rate monitor that records maximum heart rate to be able to perform this test properly.)

Once you have established your MHR, simply use the percentage ranges in column four of the tables to set your own heart rates.

Functional Threshold training zones

Your functional threshold (FT) is the best average effort you can possibly manage in one hour of non-stop riding. Thankfully, you don't have to enter a 25-mile time trial to work out your FT. Use the following test ride (devised by Hunter Allen of Training Peaks) to calculate a 'real-world' FT:

- 1 Ride Easy for 20 minutes.**
- 2 Do 3 x 1min at a high cadence (120rpm) in a small gear with one minute Easy after each.**
- 3 Ride Easy for a further four minutes.**
- 4 Ride as hard as possible for a further five minutes.**



YOUR COACH

Oliver Roberts is a level two coach, specialising in cycling and triathlon, who works with PBscience.com. Over the past 10 years, he's created training programmes for the Race for Life 5K series, had three training manuals published and has coached athletes of all abilities, from novices to national champions, World Championship contenders and a National Ironman record holder.

- 5** Ride Easy for 10 minutes.
- 6** Ride as hard as you can for 20 minutes.

Aim to finish the 20 minutes having given absolutely everything. (You'll need to be able to record an average power or heart rate for the 20-minute all-out effort.) Once back

home, work out the average power or HR for that final 20-minute effort, and multiply that number by 0.95. This is your FT. Use it to calculate your training zones, using the percentages in columns five and six depending on whether your number is a heart rate or a power rating.

TRAINING ZONES

ZONE	EFFORT	YOU CAN...	% MHR	% FTP	% FTHR
1	Easy	Speak, sing and even dance!	65% or below	up to 55%	Up to 68%
2	Slow	Chat freely	around 70%	56-75%	69-83%
3a	Steady	Just about hold a conversation	around 75%	76-85%	84-90%
3b	Brisk	One sentence at a time, now!	around 80%	86-90%	91-94%
4	Threshold	Manage short sentences at best	around 85%	91-105%	95-105%
5	Hard	Only get out the odd word (you're breathing hard!)	around 90%	106-120%	106% or more
6	Very Hard	Grunt! Gasp! Pant!	N/A	121-150%	N/A

Expand your comfort zone

Winter; a season conducive to long, steady training rides. Try adding a bit more pep to your pedalling this year..

Most training plans have a pretty straightforward approach to winter: build a regular riding habit, gradually extend your long ride, and only then begin introducing blocks of 'tempo' work up to around Function Threshold (see p2). It's an approach that makes sense, works well and will almost certainly help you improve if you stick with it. But it's not the only way. It's arguably just as effective to take a look at your strengths as a rider and then to spend the winter working on the things you're not as good at. If you're happiest hammering up a load of little hills and would rather contest a crit than take part in a time trial, this plan is designed to take you out of your comfort zone and develop the steady-state fitness that will help you make the most of your natural 'pounciness' next season.

What's involved

The sessions in this plan are designed to serve two purposes. The first is to build a decent platform of general conditioning by building up a base load of

upper Zone 2 riding and then adding in blocks of, initially, Zone 3a and, later, Zone 3b on top. The second purpose is to encourage you to spend time working on your areas of potential weakness, which means big gear work at low cadences, controlled surges on short hills where the emphasis is on sustaining the underlying effort on the downhill and the flat, and 'isopower' riding where you try to keep an absolutely even effort despite the changing terrain. The plan also includes two Functional Threshold tests — in weeks four and 12 — so that you'll have the chance to see how your fitness has progressed by the end of the plan.

**THIS IS
THE PLAN
FOR YOU
IF...**

**You're a road racer
or mountain biker
looking for an
extra edge**

**You tend to fade
during longer rides**

**You often find yourself coasting
down rideable descents**

**You struggle to assess your
effort over varied terrain**





KEY SESSIONS

Steady riding

Both Zone 2 and Zone 3a riding improve your power at Lactate Threshold, increase the number of mitochondria in your working muscles, improve your efficiency and help convert your sprint muscle fibres to endurance fibres, but, if time is short, building up the proportion of Zone 3 work in the ride will tend to get the job done quicker.



Big gear work

Peddalling slowly against the high resistance of a big gear doesn't build leg strength in a scientific sense, but it does put a large amount of torque through the muscles. And that's a useful bridge towards riding faster on flat routes, better time trialling and even powering over little lumps without having to attack them.

Rolling ride

You might think that rides where you push harder up lots of little climbs would be easy for a punchy rider, but the trick here is to maintain a constant foundation effort right at the top of Z2. Combine that with the controlled harder climbs and your lactate levels should start to rise and then stabilise at a higher level than you'd get with normal 'hard-easy' efforts.

Block 1 Settling into training

WEEK	MONDAY	TUESDAY	WEDNESDAY	
1 YOUR WEEK'S TRAINING GOAL To settle into a regular pattern of weekly rides	60min. Ride on the border of Z2 and Z3a at 90-95rpm.	REST DAY	60min. Ride on the border of Z2 and Z3a at 90-95rpm.	
2 YOUR WEEK'S TRAINING GOAL To start increasing the duration of your rides	REST DAY	75min. Ride on the border of Z2 and Z3a at 90-95rpm. 	75min. Ride on the border of Z2 and Z3a at 90-95rpm.	
3 YOUR WEEK'S TRAINING GOAL To extend your weekday rides to their maximum duration	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm.	90min. Ride on the border of Z2 and Z3a at 90-95rpm. 	
4 YOUR WEEK'S TRAINING GOAL To recover ahead of Sunday's Functional Threshold test	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm.	60min easy spin. No goals other than a relaxed ride.	

THURSDAY

60min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 5 x 5min at 50-60rpm.

FRIDAY



SATURDAY

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 60min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

SUNDAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.

TRY THIS

Choose a flat, non-technical route for your long rides so that you have no option but to sit and roll along at a consistent, continuous effort

REST DAY

75min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 4 x 7min at 50-60rpm.

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 75min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

TRY THIS

Keep the effort on the flats and downhill consistent, that's easiest if you keep a close check on your climbing effort. Do push every last rise in the middle block!

REST DAY

90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 3 x 10min at 50-60rpm.

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2 then do 90min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

3hr. Ride on the border of Z2 and Z3a at 90-95rpm.

REST DAY



90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

2hr including an FT test (see p2)

TRY THIS

Choose a course for this session that you can revisit in week 12 so that you can compare performances. A flat, anti-clockwise circuit that lasts 30min is ideal

Block 2 Strengthen your weaknesses

WEEK	MONDAY	TUESDAY	WEDNESDAY
5 YOUR WEEK'S TRAINING GOAL To insert blocks of harder work without easing back on your basic Z2 effort	REST DAY	90min. Ride at 90-95rpm. Start with 30min Z2 then do 3 x 10min Z3a with 5min Z2 after each. Finish the ride with a further 15min Z2.	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain. <div> TRY THIS If you feel like you're tiptoeing up the hills and hammering the descents, you're probably holding a nice even power output </div>
6 YOUR WEEK'S TRAINING GOAL To focus on maintaining an even effort despite terrain and cadence	REST DAY 	90min. Ride at 90-95rpm. Start with 30min Z2 then do 3 x 12min Z3a with 3min Z2 after each. Finish the ride with a further 15min Z2.	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain.
7 YOUR WEEK'S TRAINING GOAL To maintain a consistent output despite very short rests on Tuesday	REST DAY	90min. Ride at 90-95rpm. Start with 30min Z2 then do 3 x 14min Z3a with 1min Z2 after each. Finish the ride with a further 15min Z2.	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain.
8 YOUR WEEK'S TRAINING GOAL To relax and let the reduced volume freshen you up	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm. <div> TRY THIS Use your recovery week to review your progress. Check whether you need to change your routes. Is your bike in good nick? Do you need to buy more drink mix? </div>	75min easy spin. No goals other than a relaxed ride.

THURSDAY

90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 5 x 5min Z3a at 60-65rpm.

FRIDAY

REST DAY

SATURDAY

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 60min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

SUNDAY

3hr. Ride on the border of Z2 and Z3a at 90-95rpm.



90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 4 x 7min Z3a at 60-65rpm.



REST DAY

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 75min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

3hr 30min. Ride on the border of Z2 and Z3a at 90-95rpm.

90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 3 x 10min Z3a at 60-65rpm.

REST DAY



2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2 then do 90min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

4hr. Ride on the border of Z2 and Z3a at 90-95rpm.



REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

2hr 30min. Ride on the border of Z2 and Z3a at 90-95rpm.

Block 3 Turning weakness into strengths

WEEK	MONDAY	TUESDAY	WEDNESDAY
9 YOUR WEEK'S TRAINING GOAL To step up to higher intensities on Tuesday and Saturday	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm apart from 2 x 10min Z3b and 80-90rpm in the in the middle of the ride. TRY THIS Find yourself a repeatable 20min loop for these rides. Look for a flatish route with no right turns, only left turns so you don't have to turn across traffic	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain.
10 YOUR WEEK'S TRAINING GOAL Two solid sweetspot efforts on Tuesday	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 2 x 15min Z3b and 80-90rpm in the in the middle of the ride.	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain.
11 YOUR WEEK'S TRAINING GOAL To maintain the consistency in the final week of build-up	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 2 x 20min Z3b and 80-90rpm in the in the middle of the ride.	90min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm. Keep your output consistent despite the terrain.
12 YOUR WEEK'S TRAINING GOAL Simple really, beat your performance from week four	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm. 	90min easy spin. No goals other than a relaxed ride.

THURSDAY

90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 3 x 10min Z3a at 60-65rpm.

FRIDAY

REST DAY

SATURDAY

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 60min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

SUNDAY

4hr. Ride on the border of Z2 and Z3a at 90-95rpm.



90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 3 x 10min Z3a at 60-65rpm.

REST DAY



2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 75min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

TRY THIS

Take care not to push so hard up the climbs that you have to ease back on the downhill. Keep the pressure at a solid Z2!

4hr 30min. Ride on the border of Z2 and Z3a at 90-95rpm.

90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 3 x 10min Z3a at 60-65rpm.

REST DAY

2hr. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2 then do 90min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

5hr. Ride on the border of Z2 and Z3a at 90-95rpm.

TRY THIS

If you fancy adding some extra spice to your long ride, consider switching out your long ride for a 60-80 mile sportive

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

2hr including an FT test (see p2)

TRY THIS

Keep as much about this ride the same as the previous week. The same route at the same time on the same bike and eating and drinking the same.

Rev up your diesel engine

It's no good being as strong as an ox if you've only got one speed. Here's how to bring out your inner racehorse

I'm a diesel rider. I worship at the altar of Tony Martin and I'm happiest rolling along, keeping my power output even and eating up the miles as I gradually grind anyone unlucky enough to be on my wheel into submission with the constant 'just hard enough to burn' pace that I love. And, full disclosure, I hate doing the training that I've put in this plan. But I do do it — and I'm offering it to you — because working at what we're bad at over the winter can reap some big rewards, particularly if whoever's on your wheel decides to jump around you on a climb! Ego-driven? Maybe. But if you've been pushing the steady mileage for a few seasons and are getting less and less back in return, this might be just the change of pace you need.

What's involved

In some ways you could see this plan as an example of reverse periodisation for a sportive rider whose key training will likely

include blocks of sweetspot riding and some very long Zone 2 rides.

Over the course of three four-week blocks, this plan aims to improve your ability to change pace quickly and repeatedly, extend your ability to hold efforts above your Maximum Lactate Steady State, and increase the range of cadences at which you can operate effectively. All of which should make you a more versatile rider and provide a springboard to riding at a higher level once you reintroduce more traditional threshold-based training and clearance work in the spring.

**THIS IS
THE PLAN
FOR YOU
IF...**

Endurance and even pacing are your strengths

You're a time triallist or sportive rider looking to step up a level

You struggle to handle sudden attacks by other riders

You often end up churning away at a cadence below 90rpm





KEY SESSIONS

Progressive intervals

Right from Week One of this plan you'll find yourself doing intervals once a week. Each week, the duration of the efforts will increase but the number to be completed will decrease — the output needs to remain as consistent as you can manage. The recoveries are always longer than the intervals themselves, so start hard and hold on as best you can for each effort.

Hill sprints

Instead of a programme of (potentially very tiring) 30sec Burgomaster intervals, this plan uses hill sprints to lever up your accessible power output and to help you develop a feel for the mechanics of changing pace on the road.

High-cadence blocks

Blocks of work above 100rpm are intended to push up your efficiency and also help to give focus to your Zone 2 riding, as well as making you better able to carry speed over varying terrain. You'll probably find your heart rate rises rather easily, so if you drift into Z3a towards the end of the block don't worry.

Zone 3 surges

Blocks 2 and 3 of this plan include extended blocks of Zone 3a at 80rpm, where you're asked to surge at regular intervals. These add a layer of pace change and cycling-specific core training to this conditioning ride.


Block 1 Getting under way

WEEK	MONDAY	TUESDAY	WEDNESDAY	
1 YOUR WEEK'S TRAINING GOAL To seek out a series of ride routes that you can reuse each week	60min. Ride on the border of Z2 and Z3a at 90-95rpm apart from 5 x 10sec standing hill sprints spread out through the ride.	REST DAY	60min. Ride on the border of Z2 and Z3a at 90-95rpm. 	
2 YOUR WEEK'S TRAINING GOAL To settle into your regular riding pattern	REST DAY	75min. Ride on the border of Z2 and Z3a at 90-95rpm apart from 5 x 15sec standing hill sprints spread out through the ride. 	75min. Ride on the border of Z2 and Z3a at 90-95rpm.	
3 YOUR WEEK'S TRAINING GOAL To extend your total ride time without reducing your work rate	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm, except for 5 x 20sec standing hill sprints spread out through the ride.	90min. Ride on the border of Z2 and Z3a at 90-95rpm.	
4 YOUR WEEK'S TRAINING GOAL To benchmark your current performance levels with a 20min FT test	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm. 	60min easy spin. No goals other than a relaxed ride.	

	THURSDAY	FRIDAY	SATURDAY	SUNDAY
	<p>60min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 100rpm.</p>	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 14 x 1min at the top of Z4 and around 100rpm, with 2min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>2hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p> <div data-bbox="818 405 997 580"> <p>TRY THIS Stand to climb any hills that are longer than a minute on all your Sunday rides. If you need to, drop your cadence to around 80rpm to stay out of the saddle</p> </div>
	<p>75min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 105rpm.</p>	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 8 x 2min at the top of Z4 and around 100rpm, with 3min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>2hr 30min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p> <div data-bbox="801 711 1020 919">  </div>
	<p>90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at around 110rpm.</p>	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 6 x 3min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p> <div data-bbox="698 1027 878 1203"> <p>TRY THIS Saturday's hard session is followed by your longest ride. Refuel well after and ideally have a recovery drink providing 20g of protein and 60g of carbs within 20min of finishing</p> </div>	<p>3hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p>
	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 10 x 1min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>REST DAY</p>	<p>2hr including an FT Test (see p2-3)</p> <div data-bbox="818 1299 997 1474"> <p>TRY THIS Use the results from this test to check your training zones (see p2-3). You need to be training based on where you are now, not where you would like to be or have been in the past</p> </div>

Block 2 Picking up steam

WEEK	MONDAY	TUESDAY	WEDNESDAY
5 YOUR WEEK'S TRAINING GOAL To maintain a solid Z3a base effort on Thursday	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm except for 6 x 30sec standing hill sprints spread out through the ride.	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 110rpm.
6 YOUR WEEK'S TRAINING GOAL To complete an extra sprint on Tuesday without holding back in the earlier efforts	REST DAY 	90min. Ride on the border of Z2 and Z3a at 90-95rpm apart from 7 x 30sec standing hill sprints spread out through the ride.	90min Ride on the border of Z2 and Z3a throughout. Stay at 90-95rpm except for 3 x 10min at 115rpm. TRY THIS Choose a flat route with the minimum number of turns and traffic lights so you can concentrate on your cadence. An out-and-back would be ideal
7 YOUR WEEK'S TRAINING GOAL To stay out of the saddle for all of Tuesday's hill sprints	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm apart from 8 x 30sec standing hill sprints spread out through the ride.	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 3 x 10min at 120rpm. TRY THIS Even in winter you will be sweating. Make sure you use a drink containing both electrolytes and carbs on every ride. Aim to drink a minimum of 500ml per hour
8 YOUR WEEK'S TRAINING GOAL To enjoy a relaxed ride on a different route on Sunday	REST DAY 	90min. Ride on the border of Z2 and Z3a at 90-95rpm.	75min Easy spin. No goals other than a relaxed ride.

	THURSDAY	FRIDAY	SATURDAY	SUNDAY
	<p>90min. Ride on the border of Z2 and Z3a except for 30min Z3a at 80rpm. During the 30min block do a 15sec seated, high-cadence burst at the start of every fifth minute.</p>	<p>REST DAY</p> <p>TRY THIS The goal of each 15sec burst is to stay in the same gear and stomp the cadence up quickly and smoothly without rocking or bouncing</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 8 x 2min at the top of Z4 and around 100rpm, with 3min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>3hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p> 
	<p>90min. Ride on the border of Z2 and Z3a, apart from 35min Z3a at 80rpm. During the 35min block do a 15sec seated, high-cadence burst at the start of every fifth minute.</p>	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 6 x 3min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>3hr 30min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p>
	<p>90min. Ride on the border of Z2 and Z3a except for 40min Z3a at 80rpm. During the 40min block do a 15sec seated, high-cadence burst at the start of every fifth minute.</p>	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 5 x 4min at the top of Z4 and around 100rpm, with 5min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>4hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p>
	<p>REST DAY</p>	<p>90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 10 x 1min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.</p>	<p>REST DAY</p>	<p>3hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.</p> <p>TRY THIS Resist the temptation to fill your time with tasks, and chores this week. An extra hour in bed each day would be better for your cycling!</p>

CYCLING

Fitness **FASTER PLAN**

Block 3 Full speed ahead

WEEK	MONDAY	TUESDAY	WEDNESDAY
9 YOUR WEEK'S TRAINING GOAL To maintain a consistent output across all of Tuesday's intervals	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm, except for 6 x 1min all-out efforts spread out through the ride. Take at least 2min easy spinning after each. <div> TRY THIS All-out efforts are tough. Stand to hit the start of each one, then sit and suffer until the minute is up. They're best done on a turbo or as reps up and down a single climb. </div>	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 120rpm.
10 YOUR WEEK'S TRAINING GOAL To increase your high-intensity workload without compromising on effort	REST DAY 	90min. Ride on the border of Z2 and Z3a at 90-95rpm except for 8 x 1min all-out efforts spread out through the ride. Take at least 2min easy spinning after each.	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 120rpm.
11 YOUR WEEK'S TRAINING GOAL To soldier on through a final week of winter work	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm except for 10 x 1min all-out efforts spread out through the ride. Take at least 2min easy spinning after each.	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm except for 3 x 10min at 120rpm.
12 YOUR WEEK'S TRAINING GOAL To retest your fitness to see how you've improved	REST DAY	90min. Ride on the border of Z2 and Z3a at 90-95rpm.	90min easy spin. No goals other than a relaxed ride. 

THURSDAY

90min. Ride on the border of Z2 and Z3a except for 40min Z3a at 80rpm. During the 40min block do a 15sec seated, high-cadence burst at the start of every fifth minute.

FRIDAY

REST DAY

SATURDAY

90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 6 x 3min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.

SUNDAY

4hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.



90min. Ride on the border of Z2 and Z3a except for 40min Z3a at 80rpm. During the 40min block do a 15sec seated, high-cadence burst at the start of every fourth minute.

REST DAY

90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 5 x 4min at the top of Z4 and around 100rpm, with 5min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.

TRY THIS
Treat each interval like a mini time-trial. Start conservatively and keep your output as even as you can despite the terrain

4hr 30min. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.

90min. Ride on the border of Z2 and Z3a except for 40min Z3a at 80rpm. During the 40min block do a 15sec seated, high-cadence burst at the start of every third minute.

TRY THIS
Drive from your hips and thighs, keeping your knees relaxed and your feet level to start each surge — especially when you're tiring

REST DAY

90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 4 x 5min at the top of Z4 and around 100rpm, with 6min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.

5hr. Ride a rolling route on the border of Z2 and Z3a at 90-95rpm.

REST DAY

90min. Start with 5min Z1-2, then 5min at the top of Z2, 5min build to Z4, and 5min Z2 all at 90-95rpm. Next do 10 x 1min at the top of Z4 and around 100rpm, with 4min relaxed Z1-2 riding after each. Finish the ride at Z2 and around 90-95rpm.

REST DAY

2hr including an FT Test (see p2-3)

TRY THIS
Do your 20min test over the same route, after the same food at the same time and with the same preparation as week four. Try to control the variables so the efforts are comparable

First winter fitness builder

If this is to be your first winter of serious high-mileage base fitness-building, this plan is the one for you

Long slow distance. Fasted rides. Sweetspot. Cyclo-cross. Cross-training. Block periodisation. The array of training approaches available to the novice cyclist can be mind-muddling in its breadth. Every approach has its advocates (some startlingly strident), and many of the approaches can help if applied carefully and consistently. But who has the time (or confidence) to figure it all out when they're faced with their first winter of fitness-building? That's where we come in. This plan has been designed to give you a simple, predictable, progressive approach to rebuilding your cycling and raising your general conditioning between your end of season break and the start of spring.

What's involved?

The three four-week blocks of this plan build on each other to create a secure foundation of aerobic conditioning. The first block focuses on gradually increasing the total ride time from a starting point of one-hour rides and introduces some work at high and low cadences as well as some

short pushes into Zone 3a. The second block extends the time in Zone 3a into longer blocks as well as continuing the gradual increase in the length of your long weekend ride.

The third block sees you step up the intensity again, this time to Zone 3b — the sweetspot intensity that's so central to improving your overall cycling fitness. Every fourth week is easier to give you some pre-planned recovery time, and Weeks Four and 12 include Functional Threshold Tests (see p2-3) that you can use to refine your training zones and assess your progress so far.

**THIS IS
THE PLAN
FOR YOU
IF...**

**You're embarking
on your first
winter of regular
training**

**You're returning
to riding after a
long break**

**You want a cautious
but progressive general
conditioning programme**

**You haven't yet settled
on next season's goals**





KEY SESSIONS

Progressive climbing

Surging into Z3a (and later Z3b) again and again over a series of frequent short rises seems to raise lactate threshold power and improve lactate clearance while still building underlying endurance and efficiency. Focus as much on holding a strong base effort at the top of Z2 as on pushing the climbs.

Cadence work

High-/low-cadence blocks help improve efficiency by improving your body's ability to generate high torques without excessive strain. Working on a range of cadences also helps you better handle changes in terrain, as you'll be less likely to stall suddenly because you're in too big a gear or run out of momentum because you're spinning out.

Long rides

Long rides help improve blood-flow in the working muscles, fuel efficiency and overall fitness. Following the same route (or similar) each week helps refine your pace judgement and encourages you to maintain a consistent effort from week to week.

Lactate threshold

Steady-state work at the top of Z2 should push your sustainable power output up from below and increase your fitness and endurance. Keep the effort as even as possible in these rides, avoiding surges or freewheeling.

Block 1 Building basic volume

WEEK	MONDAY	TUESDAY	WEDNESDAY
1 YOUR WEEK'S TRAINING GOAL To re-establish a regular riding habit	60min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 5 x 5min at 70rpm. TRY THIS You may find it easier to keep a low cadence even if you do the blocks up a long, gradual climb	REST DAY	60min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm, except for 5 x 5min at 100rpm.
2 YOUR WEEK'S TRAINING GOAL To extend your total ride time without reducing work rate	REST DAY	75min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 4 x 7min at 70rpm.	75min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm, except for 4 x 7min at 100rpm.
3 YOUR WEEK'S TRAINING GOAL To settle into your maximum duration for midweek riding	REST DAY	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 3 x 10min at 70rpm.	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm, except for 3 x 10min at 100rpm. TRY THIS If you're bouncing a lot on the saddle, relax, drop the cadence and effort slightly until you settle, then gradually pick it up again. A really flat route will help
4 YOUR WEEK'S TRAINING GOAL To recover before a benchmark FT test on Sunday	REST DAY 	60min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 3 x 10min at 100rpm.	REST DAY

THURSDAY

FRIDAY

SATURDAY

SUNDAY

REST DAY



90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 30min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 45min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

TRY THIS
Pick a rolling route with lots of short rises (10sec-1min) and simple, straight downhill, the real trick here is to keep the underlying Z2 effort up

REST DAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.



REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2, then do 60min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

REST DAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 30min pushing up to Z3a on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

60min easy spin. No goals other than a relaxed ride.

TRY THIS
This ride is simply to loosen your legs off before Sunday. Really take it easy and aim to come home feeling fresher than when you started

2hr including an FT Test (see p2-3)

Block 2 Adding controlled load

WEEK	MONDAY	TUESDAY	WEDNESDAY
5 YOUR WEEK'S TRAINING GOAL To introduce blocks of harder work into your ride	REST DAY	90min. Ride at 90-95rpm. Start with 30min Z2, then do 3 x 10min Z3a with 5min Z2 after each. Finish the ride with a further 15min Z2. 	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 70rpm, 5min at 90rpm, 10min at 100rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
6 YOUR WEEK'S TRAINING GOAL To begin extending your Sunday ride while maintaining a consistent effort	REST DAY 	90min. Ride at 90-95rpm. Start with 30min Z2, then do 3 x 12min Z3a with 3min Z2 after each. Finish the ride with a further 15min Z2.	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 60rpm, 5min at 90rpm, 10min at 105rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
7 YOUR WEEK'S TRAINING GOAL To stay squarely in the correct zones in every ride this week	REST DAY	90min. Ride at 90-95rpm. Start with 30min Z2, then do 3 x 14min Z3a with 1min Z2 after each. Finish the ride with a further 15min Z2.	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 50rpm, 5min at 90rpm, 10min at 110rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
8 YOUR WEEK'S TRAINING GOAL To give your body time to rebuild and reset before the final block	REST DAY	75min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm, except for 3 x 10min at 110rpm.	REST DAY 

THURSDAY

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 30min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

FRIDAY

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 45min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

TRY THIS

If you find you need to freewheel on the downhill, it probably means you're hitting the climbs too hard. Use the same route as last block so you have a comparison

SATURDAY

REST DAY

REST DAY

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2 then do 60min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z3b on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

75min easy spin. No goals other than a relaxed ride.

TRY THIS

Use the easier rides this week to explore some different routes, or perhaps to head out for a ride with a different group

SUNDAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.



2hr 30min. Ride on the border of Z2 and Z3a at 90-95rpm.

3hr. Ride on the border of Z2 and Z3a at 90-95rpm.

TRY THIS

Drink 500ml of electrolyte/carb energy drink and eat half an energy bar every hour of your Sunday rides from now on

REST DAY

2hr. Ride on the border of Z2 and Z3a at 90-95rpm.

Block 3 Slightly increasing intensity

WEEK	MONDAY	TUESDAY	WEDNESDAY
9 YOUR WEEK'S TRAINING GOAL To introduce efforts focusing on your maximum lactate steady state	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm, except for 2 x 10min Z3b and 80-90rpm in the middle of the ride. 	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 50rpm, 5min at 90rpm, 10min at 110rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
10 YOUR WEEK'S TRAINING GOAL To extend Tuesday's efforts while maintaining the same work rate as last week	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm, except for 2 x 15min Z3b and 80-90rpm in the middle of the ride.	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 50rpm, 5min at 90rpm, 10min at 115rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
11 YOUR WEEK'S TRAINING GOAL To complete a final solid week of general endurance conditioning	REST DAY	90min. Ride on the border of Z2 and Z3a and 90-95rpm except for 2 x 20min Z3b and 80-90rpm in the middle of the ride.	90min. Ride on the border of Z2 and Z3a throughout. Start with 15min at 90-95rpm, then do the following sequence twice through: 10min at 50rpm, 5min at 90rpm, 10min at 120rpm, 5min at 90rpm. Finish with another 15min at 90-95rpm.
12 YOUR WEEK'S TRAINING GOAL To beat the distance covered in week four's FT Test on Sunday	REST DAY	90min. Ride on the border of Z2 and Z3a throughout. Stay around 90-95rpm apart from 3 x 10min at 120rpm.	REST DAY 

THURSDAY

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

SATURDAY

REST DAY

SUNDAY

3hr. Ride on the border of Z2 and Z3a at 90-95rpm.



REST DAY



90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2, then do 45min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

REST DAY

3hr 30min. Ride on the border of Z2 and Z3a at 90-95rpm.

TRY THIS

It's tempting to vary routes as your ride length increases, but from a fitness perspective you'll get much more out of simply gradually extending your ability to hold a solid pace.

REST DAY

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 15min Z2 then do 60min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 15min Z2 at 90rpm.

TRY THIS

An hour of solid repeated Z4 climbing is a tough workout. Make sure you have eaten 1-2 hours before you start, and keep your effort under control on the early short climbs.

REST DAY

4hr. Ride on the border of Z2 and Z3a at 90-95rpm.

90min. Ride a rolling route on the border of Z2 and Z3a. Start with 30min Z2 then do 30min pushing up to Z4 on any rises, recovering to Z2 on the flats and downhill. Finish with 30min Z2 at 90rpm.

REST DAY

90min easy spin. No goals other than a relaxed ride.

2hr including an FT Test (see p2-3).

TRY THIS

Treat the test effort like a race. Start fuelled, warm up well, hold back to start then build up and suffer to finish.

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